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SPACEHOUNDS OF IPC

by Edward E. Smith, Ph.D.

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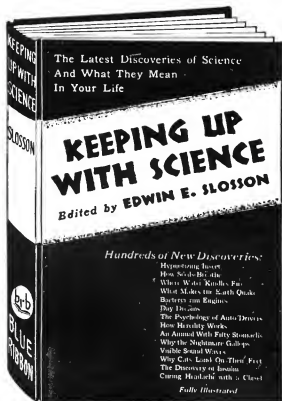
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AMAZING STORIES

Scientific Fiction

Vol. 6

August, 1931

No. 5

In Our Next Issue

THE ARRHENIUS HORROR, by P. Schuyler Miller. According to a theory propounded by some scientists, silicon is the next in likelihood to our own carbon as the basis of a life-system such as we know. If this is true, what assurance do we have that a world of silicate-creatures might not exist in the universe? This youthful writer, we feel sure, needs no further introduction as a spinner of unusual scientific fiction. In this story, as in the two preceding ones, there is definitely a "Merritt feeling" prevalent throughout.

PRIMA DONNA, 1980, by Bernard Brown. From the country of the famous H. G. Wells, comes a story of the future in the cultural field. It is a unique story, cleverly told and very interesting.

SPACEHOUNDS OF IPC. (A Serial in three parts.) Part III. By Edward E. Smith, Ph.D. In the concluding chapters, which race along in the true Smith style, our scientist friends are reunited after fast and furious battles in interstellar space, against resourceful enemies, inimical to all the universe.

THE SPHERE OF DEATH, by J. W. Groves. It is not pleasant to contemplate what the next war will probably be like, now that chemists are on the job. Perhaps for that reason some inventions that are bound to come in the future have not yet been thought of, for humanity is not ready to use marvelous inventions purely as a gift to mankind. It makes one uneasy to think of what might happen if, by a strange accident, some such thing as this author describes, should be invented. But this story holds the reader's interest and is provocative of thought.

THE LUNAR CHRYSALIS, by Raymond Gallun. What if the seasonal changes which have recently become noticeable, should reach the point of injuring humanity? One very marvelous solution—providing the method can be discovered—is offered by Mr. Gallun in this excellent tale of scientific fiction.

And other unusual science fiction.

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Our Cover

This issue depicts a scene from the 2nd instalment of "Spacehounds of IPC," by Edward E. Smith, Ph.D., in which the two castaways in space (Stevens, with one hand hooked under Nadia Newton's belt) plunge through space, in an effort to get to another fragment of their ship, as the battle-rays between two enemy ships are flaring around them.

Cover illustration by Morey

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Stanton A. Coblentz, an author whose name alone quickens interest, writes for this issue a full, book-length novel called "The Blue Barbarians." It concerns our favorite subject—interplanetary adventure!

Then there is the tale by Roscoe B. Fleming, called "The Menace of the Little," which relates in vivid style the invasion of the earth by beings twelve inches high from another planet!

David H. Keller, M.D., contributes to this same issue with "Half-Mile Hill"—the nth degree of clever, scientifiction invention—and A. W. Bernal, with "Cosmic Menace," presents a terrific and awe-inspiring picture of the earth projected upon a new orbit by its inhabitants!



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Extravagant Fiction Today - - - - - Cold Fact Tomorrow

A Curious Substance

By T. O'Connor Sloane, Ph.D.



RELATIONS to humanity of the globe we inhabit are, it is fair to say, not realized by mankind, as they go along in their everyday existence. The metropolitan area of New York contains an astonishingly large proportion of the inhabitants of the world. It would take but two hundred such districts to accommodate the entire population of the earth. If we now come to the structure of the earth proper, a similar condition obtains; mankind uses an absolutely minute portion of it for its needs. To arrive at the idea of its composition we have to consider its specific gravity, which approximates that of iron. This leads to a theory, that the principal volume of this sphere, what we may term its core, is a mass of iron, probably of the meteoric type. Over this core there are spread the surface layers of the earth and of these we have a very limited knowledge as we cannot get down deep enough to know what we are standing on. But they form a mere film compared to the sphere itself. The spherical contour of the earth may be taken as a proof that it originally was in the liquid state, that it was a mass of liquid iron, melted in some cosmic furnace. The substances which mankind extracts from the earth for his uses are of infinitely small amount compared to the great globe.

And there is one substance found upon the earth in this film or layer, comparatively speaking, in extremely minute quantity, which, without the appreciation of most of us, has the most astonishing properties, and does the most astonishing things. This substance is an inert fluid. Yet if you insert in it a little tube of the proper materials, and you have your choice of a great many, it would start to creep up it as if it had a multiplicity of little hands pulling it up along the sides of the tube.

A story is told that in Rome an obelisk was being hoisted to its pedestal, until a point was reached when the mechanism could wind in no more rope; there was still a slight distance left to be raised. A voice from the crowd is said to have called out to apply this curious liquid to the rope. This was done, the liquid immediately began to crawl through all the myriad pores of the rope, countless threads of the fluid pulled themselves up, making it a little bit thicker, and necessarily a little shorter and the obelisk rose to its place. The pulling was done by the layer of molecular "thinness" on top of each thread. From the same liquid we can make little balloons approximating molecular dimensions in thickness; so thin that they can cause interference of light-waves, or even are too thin to do this.

The chemical powers of this curious substance are so strange as to be almost inexplicable. Chemistry tells us what it does, but the why and wherefore may be justly termed a mystery. We can take some chemical compounds such as common salt; we can heat them to a white heat, making them pass through the liquid state and even vaporize and they never change, but remain a

chemical compound. The molecules of salt contain one atom of chlorine and one atom of sodium and a white heat does not separate them. Other chemical compounds yield to high heat and may decompose and simply separate into their constituents. There are other ways of effecting decomposition requiring in many cases energetic action, and energetic action often fails. But this same curious substance, which is said to have raised the Roman obelisk the last fraction of an inch, which applied to dry wooden wedges, can enter their pores and swell them up and split rocks with them; if allowed to act upon a chemical compound, in many cases will instantly produce what are known as ions, tearing the stable molecule apart. This is a very wonderful achievement. Those of us who are fortunate enough to have preserved the faculty of astonishment, can truly wonder at this action. In a sense, it is one of the commonest things in the world.

This curious substance has no color and is perfectly transparent. Yet we may take various chemical compounds, which are almost without the least tint and it will produce bright colors. Anhydrous copper sulphate is a light-colored powder, almost white and almost ugly. The same may be said of iron proto-sulphate. Add to these our colorless transparent liquid and it turns one of them a brilliant blue, the other a pale green, and gives brilliant sapphire-like and beryl-like crystals. We may take a compound in the organic world, for example rosanilin, which is a lustrous brilliant green solid, put it into this liquid, and you have a beautiful red solution.

It is a general rule that heat expands substances and cold contracts them. But there is a place well down on the thermometric scale, where heat contracts this substance and cold expands it. It can be changed from a liquid into a solid by lowering its temperature a little further. The change takes place instantly and an expansion of enormous force to an amount of nearly ten per cent. of the volume occurs. It can hold in suspension gold, silver and other metals, so finely divided that they can only be recognized by the colors they impart to it. And these colors are brilliant and varied.

Our story could be endlessly prolonged. The substance we are describing may justly be termed unique. There is none other like it and a volume could be devoted to telling what it does. It would be rather interesting to let this all stand and have our readers tell us what it is that we are talking about; what the substance is that can do such wonders in the mechanical world and in the realms of physics and chemistry, that brings us close to the molecule and which is a simple transparent liquid devoid of color, taste or odor. We would even suggest to our readers who are scientifically disposed, who study the wonders of nature to stop here, and see if they know what it is that we have been talking about. Our wonder-worker is nothing but plain water. It does things which nothing else in the world can do.

Submicroscopic

IF some expert on atoms, or perhaps some genius of cosmology, should once again establish a definite theory about our solar system—that our world, for instance, is nothing but an electron, with the sun as the nucleus, for since all things are relative, according to Einstein, then size is too. If by some means, scientific, of course, one could transport himself to another atom—or world—what would he be likely to find? Capt. Meek's stories are almost invariably fine. His ideas on the subject of possible inhabited atoms gives him an excellent opportunity to tell these ideas. Of this he avails himself beautifully—as you will agree after you have read "Submicroscopic."

By Capt. S. P. Meek, U. S. A.

Author of "The Malignant Entity," "The Drums of Tapajos," etc.

AFTER many weary months of toil my task has been completed. As the sun sank to rest today, I soldered up the last connection on my Electronic Vibration Adjuster and in the fading twilight I tested it. It functions perfectly and as soon as the sun rises tomorrow I will leave this plane, I hope forever. I had originally intended to disappear without trace, as I did once before, but as I sit here waiting for the dawn, such a course seems hardly fair. This plane has treated me pretty well on the whole and I really ought to leave behind me some record of my discoveries and of my adventures, possibly the strangest adventures through which a man of this plane has ever passed. Besides, it will help to pass the time which must elapse before I can start on my journey.

My name is Courtney Edwards. I was born thirty-four years ago in the city of Honolulu, the only child of the richest sugar planter in the Islands. When I arrived at high school age I was sent to the mainland to be educated and here I have stayed. The death of my parents left me wealthy and rather disinclined to return to the home of my youth.

I did my bit in the Air Corps during the war and when it was over I shed my olive drab and went back to the University of Minnesota to finish my education. My interest in science started when I attended a lecture on the composition of matter. It was a popular lecture intended for non-science students, and so it wasn't over my head. Dr. Harvey, one of our most popular professors, was the speaker and to this day I can visualize him standing there and can even recall some of his words.

"To give you some idea of the size of an atom," he said, "I will take for an example a cubic millimeter of hydrogen gas at a temperature of 0 degrees Centigrade and at sea-level pressure. It contains roughly ninety quadrillions of atoms, an almost inconceivable number. Consider this enormous number of particles packed into a cube with an edge less than one-twentieth of an inch long; yet so small are the individual atoms compared with the space between them that the solar system is crowded in comparison."

"In order to get at the ultimate composition of matter, however, we are forced to consider even smaller units. An atom is not a solid particle of matter, but instead consists of smaller particles called protons and electrons. The protons are particles of positive electricity which exist at the center or the nucleus of the atoms and the electrons are particles of negative electricity some of which revolve about the central portion and in most elements some are in the nucleus. Each of these particles is as small compared to the space between them as is the case with the atoms in the molecule."

I left the lecture hall with my head in a whirl. My imagination had been captured by the idea of counting and measuring such infinitesimal particles and I went to Dr. Harvey's office the next day and sought an interview.

"I wish to ask some questions relative to your talk last night, Doctor," I said when I faced him.

His kindly grey eyes twinkled and he invited me to be seated.

"As I understood you, Doctor," I began, "the space

between the atoms and between the electrons and protons in each atom is so vast compared to their bulk that if you were to jam the protons and electrons of a cubic mile of gas together until they touched, you couldn't see the result with a microscope."

"Your idea is crudely expressed, but in the main accurate," he answered.

"Then what in the name of common sense holds them apart?" I demanded.

"Each of the atoms," he replied, "is in a state of violent motion, rushing through space with a high velocity and continually colliding with other atoms and rebounding until it strikes another atom and rebounds again. The electrons are also in a state of violent motion, revolving around the protons and this combination of centrifugal force and electrical attraction holds the atom in a state of dynamic equilibrium."

"One more question, Doctor, and I'll quit. Are these things you have told me cold sober fact susceptible of proof, or are they merely the results of an overactive imagination?"

He smiled and then leaned over his desk and answered gravely.

"Some of them are solid facts which I can prove to you in the laboratory," he said. "For instance, you, yourself, with proper training could count the number of atoms in a given volume. Other things I have said are merely theories or shrewd guesses which best explain the facts which we know. There is in physical chemistry a tremendous field of work open for men who have the ability and the patience to investigate. No one knows what the future may bring forth."

The Doctor's evident enthusiasm communicated itself to me.

"I'll be one of the ones to do this work if you'll have me as a student!" I exclaimed.

"I'll be very glad to have you, Edwards," he replied. "I believe you have the ability and the will. Time alone will tell whether you have the patience."

I resigned from my course the next day and

Illustration by MOREY



A jack rabbit was my first subject and I found that I could increase this rabbit to the size of a Shetland pony . . . without visible ill effects.

enrolled as a special student under Dr. Harvey. After a period of intensive study of methods, I was ready to plunge into the unknown. The work of Bohr and Langmuir especially attracted me, and I bent my energies to investigating the supposed motion of the electrons about the nuclear protons. This line of investigation led me to the suspicion that the motion was not circular and steady, but was periodic and simple harmonic except as the harmonic periods were interfered with by the frequent collisions.

I devised an experiment which proved this to my satisfaction and took my results to Dr. Harvey for checking. He took my data home with him that night intending to read it in bed as was his usual custom, but from that bed he never rose. Death robbed me of my preceptor and Dr. Julius became the head of the Chemistry Department. I took my results to him only to meet with scorn and laughter. Dr. Julius was an able analyst, but he lacked vision and could never see the woods for the trees. The result of my interview with him was that I promptly left Minneconsin, and resolved to carry on my work at another school.

The problem on which I wished to work was the reduction of the period of vibration of the atoms and of their constituent parts. If my theory of their motion were correct, it should be possible to damp their vibrations and thus collapse matter together and make it occupy a smaller volume in space. I soon found that men like Dr. Harvey were scarce. Not a man at the head of a university department could I find who had the vision to see the possibilities of my work and in a rage I determined to conduct my experiments alone and hidden from the world until I had proved the truth of my theories.

I WAS still flying for amusement and one day while flying from Salt Lake City to San Francisco, I passed over a verdant fertile valley hidden in the almost inaccessible crags of the Timpahute range in southern Nevada. I abandoned my trip temporarily and landed at Beatty to make inquiries. Not a person could I find who had ever heard of my hidden valley. Even the old desert rats professed ignorance of its location and laughed at me when I told them that I had seen flowing water and deciduous trees in the barren stretches of the Timpahutes.

I had taken the bearings of my valley and I flew on to San Francisco and made my arrangements. I flew back to Beatty and picked up a pack outfit and landed at the foot of the crags sheltering the valley and started on foot to seek an entrance. It took me a month of careful searching to find it, but find it I did. With a little blasting, the way could be made practicable for pack burros. The stuff I had ordered at San Francisco had been delivered to Beatty and I hired packers to take it out to the Timahutes for me. I established a dump about a mile from my valley entrance and had the stuff unloaded there. When the packers had left I took my own burros and packed it in to the valley. I didn't care to have anyone find out where I was locating and so far as I know no one ever did.

When I had everything packed in, I started to work.

A few days enabled me to rig an undershot waterwheel in the stream and get enough power to turn an electric generator and thereafter I had the strength of twenty men at my call. I built a small wooden building

for a laboratory with a room in it for my cooking and sleeping.

I was fortunate enough not to meet with a single major setback in my work, and in about fourteen months I had my first piece of apparatus completed. I don't intend to tell how I did it, for I do not believe that the world is ready for it yet, but I will give some idea of how it looked and how it was operated. The adjuster has a circular base of silvery metal (it is a palladium alloy) from which rise six supports which hold up the top. The top, which is made of the same alloy as the base, is parabolic in shape and concave downward. In the parabola is set an induction coil with a sparkgap surmounting it, so set that the gap is at the focus of the reflector, which is what the top really is. The coil and gap are connected with other coils and condensers which are actuated by large storage batteries set around the edge of the base. To each of the six uprights is fastened a small parabolic reflector with a small coil and gap at the focus. These small reflectors are so arranged that they bathe the top with the generated ray while the large gap in the top bathes the rest of the apparatus.

When the gaps and coils are actuated by the current, they throw out a ray of such a wavelength that it has the same period at the electronic and atomic vibrations but is half a wavelength out of phase. The ray is effective only when it can flow freely, and the base and top serve not only as conductors, but also as insulators, for they absorb and transform the vibrations falling on them so that nothing outside of the apparatus itself and anything lying between the base and the top is affected.

When I had it completed, I naturally tested it. The whole thing was controlled by a master switch and I reached in with a small steel rod and closed the switch. Immediately the whole apparatus began to shrink. I gave a loud cheer and patted myself on the back. I got down on my knees and watched it as it rapidly diminished in size until I suddenly realized that it would soon get too small to see unless I opened my switch. I tried to reach the switch with my rod but I had waited too long. The rod would not go through the interval between the side columns. I had the mortification of seeing a year's work grow smaller and smaller until it finally vanished.

The loss of my adjuster was a blow, but at least I had proved my theory and as soon as I had rested for a few days I started in to build a duplicate. The way had already been blazed and it took me less than a year to complete my second piece of apparatus. When I tested this one I stopped the shrinking process when the adjuster was about half its original size and reversed the polarity of my coils. To my delight the adjuster began to expand until it had resumed its original proportions. Then I shut it off and began to experiment to find out its limitations.

When I had determined to my satisfaction that inanimate objects placed on the base would be expanded or contracted, I tried it on living organisms. A jack rabbit was my first subject and I found that I could increase this rabbit to the size of a Shetland pony or reduce it to the size of a mouse without visible ill effects. When I had completed this experiment, I tried the adjuster on myself.

My first experiment was to increase my size. I stepped on the base plate and turned on the current, but I could feel no effects. I looked at the landscape and

found to my amazement that something had gone wrong. I was remaining the same size but the house and the surrounding country had come under the influence of my device and was shrinking rapidly. In alarm I shut off my current and got out. The house had shrunk to one-half its normal size and I could not get in the door, even on hands and knees. An idea struck me and I reached in and hauled out a pair of scales and weighed myself. *I weighed a trifle over twelve hundred pounds.* I suddenly realized that I had succeeded beyond my wildest dreams and I reentered the adjuster and shrunk myself down to four inches tall, again with no ill effects and merely the impression that the house and landscape were growing. I returned myself to my normal size and while I was weak from excitement, otherwise I felt perfectly normal.

MY first thought was to return and confound the men who had scoffed at me but the more I considered the matter, the more I realized the importance of my invention and the need of caution in introducing it. I felt that I needed a rest anyway, so I remained in my valley to perfect my plans before announcing my discovery.

Time soon lagged on my hands. I have always been fond of big game hunting and I had an excellent rifle and plenty of ammunition, but game does not abound in the Timphutes. There were quite a few ants in the valley and it struck me that, were I to reduce myself and my rifle to the proper dimensions, I would have some good sport. The novelty of the idea fascinated me as much as the thought of the hunting and I promptly belted on a pistol and a full belt of ammunition and entered the adjuster.

I closed the switch and the house and landscape began to grow to Broddingnagian proportions, but I kept my power on until the grains of sand began to look like huge boulders and then I tried to open the switch. *It was stuck.* Thoroughly alarmed, I tried to wrench it open and as a result broke the handle—the device kept on functioning and I grew smaller and smaller. The grains of sand grew to be huge mountains and presently I felt myself falling. I realized that my adjuster had been balanced on a grain of sand and that it had slipped and was falling into the chasm between two grains. Soon it became wedged in a gloomy chasm, but it was still functioning and presently I was falling again.

A glance at the dial of my relative size indicator showed me that the needle had almost reached the point which I had indicated as infinity. Desperately I battered at the switch with my rifle butt, but it was solidly made. At last I broke it loose and the whine of my coil became audible and ran down the scale until it was silent. I had stopped shrinking but I was already far smaller than any microscope could detect and an examination of the switch soon convinced me that it was completely wrecked and that it would take me hours to repair it.

When I had finished my examination, I looked around for the first time. I could hardly believe my eyes. My adjuster was standing a beautiful sunlit glade, which was carpeted with grass and dotted with varicolored flowers. Now I will have to explain one thing. As I said, I felt no change when my size was increased and reduced; it only seemed that the familiar landscape was undergoing a change. As a result, I could never realize while

I was in Ulm, that everything was really submicroscopic, but persisted in referring everything to my normal six feet of height. In actual fact, the glade in which the adjuster stood was only a minute fraction of an inch across, but to me it looked like about half a mile and it took me ten minutes to walk it. Even now I have no idea of how small I actually was, so I will not try to describe the *absolute* size of everything, but will speak of things as they appeared to me; in other words, their *relative* size to me.

I looked over that landscape and rubbed my eyes, trying to convince myself that I was dreaming, but the scene didn't change and I realized that I had stumbled on something heretofore unsuspected—namely that our world is a very complex affair and supports many kinds of life unknown to us. Everything within the range of my vision looked normal, grass, trees and even mosquitos were buzzing around and one lit on my wrist and bit me. Imagine, if you can, what the actual measurements of that mosquito must have been!

Convinced that I was not dreaming, I stepped out of the adjuster to the grass. Before I repaired that switch I meant to have a look around and see what this miniature world was like. I had gone only a few steps from the adjuster when a lordly buck rose from the grass and bounded away. Instinctively I threw up my rifle and fired and the buck went down kicking. Assured that my weapons were functioning properly, I set off at a brisk pace across the glade. I took careful bearings with my pocket compass and expected to have no trouble in finding my way back. During the ten minutes it took me to cross the glade, I had several more chances to shoot at deer, but I passed them up. I didn't wish to waste ammunition or to call attention to myself until I knew what was ahead of me.

It was hot and sultry in the glade and I glanced up at the sun, expecting it to appear enormous, but it appeared no larger than usual, a matter which I could not explain at the time and cannot even yet. Before I reached the woods which fringed the glade I noticed that the horizon was walled in on all sides with enormous mountains, higher than any I had ever seen and it gave me a shock to realize that these mighty and imposing masses of rock were in reality only grains of sand, or perhaps even smaller; they might be particles of the impalpable dust which lies between the sand grains.

It took me perhaps ten minutes to reach the edge of the jungle, for such it proved to be. Most of the trees were of species unknown to me, although I recognized several trees of peculiarly tropical habit, among them the boabab or one of its relatives and the *lignum vitae*. The scene reminded me more of the Brazilian jungles than anything else. The ground underfoot was deep with rotting vegetation and the creepers made the going hard. I plunged into the tangle and in ten minutes I was as thoroughly lost as I have even been in my life. The gloom under the trees prevented me from using the sun as a guide and I had not read my compass when I entered the tangle.

I set a compass course and floundered forward as best I could but half an hour of steady going convinced me that I had taken the wrong direction. The jungle was too dense to back trail, so I laid a new course by compass and plunged ahead. I kept on for perhaps ten minutes on my new course when I heard a sound that brought me up standing, hardly able to believe my ears. From ahead

of me came a shout, a shout given in a human voice. I strained my ears and soon I heard it again from the same direction and somewhat closer. Some one was coming toward me and I looked for a hiding place. A tangle of baobab roots concealed me pretty well and I crouched, my rifle ready, waiting for what might appear.

IN a few moments I heard a sound of running footsteps and I peered out from my cover. Imagine my surprise when a girl, a white girl, came into view, running at top speed. Not fifty yards behind her came a group of men, or beasts, for I couldn't tell at first glance which they were. They were as black as pitch, with thick heavy lips, flat noses and almost no foreheads. They were or rather seemed to be about seven feet tall on the average, with enormously powerful chests and arms that hung below their knees. At times they dropped forward so that their knuckles rested on the ground and came ahead on all fours at a more rapid rate than their relatively short bandy legs could carry them when they were in an upright position. They were covered on the head, chest and arms with coarse black hair, although their legs, abdomens and backs were almost free from it. Their mouths were wide with the lower paw protruding somewhat with yellow fangs showing between their lips, giving them a horribly bestial expression. They had two eyes, but they were not placed as is usual with animals of the monkey or human species. One eye was set in the middle of the forehead and the other in the back of the head. They were naked except for a G string and a belt from which hung a short heavy sword, and in their hands they carried spears about ten feet long. The average weight of a full grown male in our world would have been about four hundred pounds. Of course I didn't see all of this at first glance, but later I saw enough of the Mena, as they were called, to get pretty familiar with their appearance.

A glance was enough to show me that the girl was tired and that these brutes were gaining on her. She was human and the sight of these savages made my next action purely instinctive. With a shout I stepped from my hiding place and threw my rifle to my shoulder. The girl saw me and altered her direction to come toward me. The blacks saw me, too, and they turned in my direction, brandishing their spears.

I am a pretty good shot and they were close and an easy target. I had four shells in my rifle and four of the blacks went down as fast as I could work my bolt. The rest paused for a moment and gave time to ram a fresh clip of cartridges into my rifle. As I reloaded, I picked out one of them who seemed to be a leader and I dropped him on the next shot. This made them pause again but another black devil sprang forward to take the lead and I presented him with a bit of lead in the face. He went down like a thunderbolt and as none of the rest seemed to aspire to leadership, I distributed the other three bullets where I thought they would do the most good. As I lowered my rifle to reload, another one of the blacks jumped forward and charged me, and the rest followed. I had no time to load, so I jerked out my Colt .45 and when he was about twenty-five yards away I let him have a pill in the chest and then started a little miscellaneous slaughter. By the time the Colt was empty, there were fourteen of the blacks down and the rest were retreating at full speed. I first reloaded my rifle and slipped a clip into my pistol and then looked for the girl.

I didn't see her for a moment and then I spied a lock of golden hair in the tangle at my feet. She had burrowed into the vegetation and had got pretty well covered in the few moments I was shooting. I reached down and touched her, but as soon as she found that her hiding place was discovered, she bounded up and took to her heels like a scared rabbit. I called to her and she threw a glance back over her shoulder and when she saw that I was alone she checked her speed and stood her ground. She hesitated for a moment and then came back and dropped to her knees at my feet. I lifted her up and patted her on the shoulder.

"There, little girl, don't cry," I quoted inanely, partly because I didn't know what else to say and partly because I was completely bowled over by her appearance. She was absolutely the most beautiful girl I have ever seen in my life—tall and lithe, all curves and grace, with eyes as blue as the sea around Oahu and hair where sunbeams had been imprisoned and where they struggled continuously for liberty, throwing their glints out through the meshes of their prison. Bound around her head was a golden fillet with a huge square cut stone of beautiful sparkle and radiance set in it. Around her waist and confining her garments of flowing green gauze was another golden band with a gold incrustated, gem-set pouch depending from it. On the buckle of her girdle was another of the square cut gems such as adorned her head band.

I have always been pretty much at ease in the presence of girls, principally because I never cared much for them, but to this dirty little savage, as beautiful as dawn, I didn't know what to say. I could just gulp and stammer.

"Er, do you think these rapscallions will come back for more?" I blurted out at last.

She cast a sideways glance at me that made my head whirl, and my heart do all sorts of funny flip-flops, and then she spoke. Her speech was beautifully liquid and hauntingly familiar. I couldn't understand her, but I was sure that I had heard that language before. Presently I caught a word and like a flash I knew. She was speaking some dialect of Hawaiian. Desperately I strove to recall the speech of Leilani, my old nurse, but the only phrase I could remember was "*E nae iki nei pau wai*." It didn't seem quite appropriate to say "Be true to me, fair one" to a girl I had just met, but it was for the moment the only phrase I could remember so I blurted it out.

She understood it all right and she flew into a royal rage. She shot out a stream of fluent speech so fast that I couldn't understand a word of it. I thought rapidly and then brought fourth another gem of speech, "*Hawaiian pau*." I had to repeat it twice before she understood and then she didn't get the word Hawaiian, but she understood *pau*, finished, all right and she presently realized that my first speech was the only bit of her language which I knew. When she understood my predicament, she forgot her anger and laughed. I was glad to see her cheerful again, but I was still worried about whether those blacks would return.

For lack of language I was forced to fall back on pantomime in order to make myself understood. She readily understood me and looked worried for a moment until her eye fell on my rifle. She touched it questioningly and then spurned the body of the nearest black with her foot and laughed.

Evidently she thought that my weapon made me in-

vincible, but I knew better. I had only two more clips of pistol cartridges and eighty-five rounds for my rifle, not enough to repel a real attack. I tapped my rifle, shook my head sadly and said "pau."

The worried look again came into her face and she started talking very slowly and distinctly, repeating the word "*Ulm*" several times. Gradually my Hawaiian was coming back and while her speech was not the language I had learned in my youth, for she made use of the consonants "s" and "t," both of which are unknown in Hawaiian, presently I made out her meaning. She was asking me to go with her to Ulm. I had no idea of where Ulm was but I had given up hopes of finding my adjuster and besides, since I had met this girl, I wasn't so very anxious to find it at once. It seemed to me that it might be a good idea to go to Ulm for a while, and then make a fresh start for the glade with a competent guide. I therefore gave her to understand that her program suited me. She nodded brightly and stepped in front of me and set off toward the northeast.

FOR perhaps three hours we made our way through the jungle, keeping a pretty straight line as I could tell by my compass. I found later that the people of Ulm have an uncanny sense of direction and can find their way from place to place in their miniature world without the aid of any other guide. The girl kept up a steady talk in her language and as I recalled more of my early Hawaiian, I found that I could understand the sense of most of what she said if she talked very slowly and I was even able to answer her after a fashion.

"What is your name?" I asked her.

"Awlo Sibi Tam," she replied, raising her head proudly as she did so.

"My name is Courtney," I told her.

She tried to repeat it, but she had a little trouble with the "r" sound which was evidently strange to her. She repeated it several times as we went along and at last managed to get a very fair rendition. Anyhow, I thought that I had never heard it pronounced so beautifully before.

Suddenly Awlo paused in her talk and listened intently. She turned a terror-stricken face toward me and said, "They are coming."

"Who?" I asked.

"The Mena," she replied.

I listened but I could hear nothing.

"Are there many of them?" I asked.

"Many," she replied, "hundred, I believe. They are following our trail. Can't you hear them?"

I laid my ear close to the ground and could detect a faint murmur but I would never have recognized what it was.

"What shall we do?" I asked. "This," I held up my rifle, "will kill about a hundred but no more."

"Run," she said, "run as fast as we can. It will be of little use, because the Mena can catch us. You are slow and I am tired, but if we are lucky, we may win to the plains of Ulm and there we are safe."

Her advice sounded good and I started after her as swiftly as I could. I am a fair average runner, but I could not keep up with Awlo, who fled over the ground like an antelope. I was handicapped by the weight of my rifle but I hung to it like grim death. It was not long before I could plainly hear the shouts of the pursuing Mena.

"Have we far to go?" I gasped.

"No," she replied over her shoulder. "Hurry!"

I panted along in her wake. The jungle thinned before us and we debouched onto a huge open plain. Awlo stopped and uttered a cry of dismay.

"What is it?" I demanded.

She did not answer but pointed ahead. Our way was barred by a wide, gently flowing river. Over it had been thrown a bridge but a glance showed me that the center span had been removed and a gap twenty feet wide yawned in the middle of the structure.

"Can you swim?" I asked.

She looked at me interrogatively. Evidently the word was a new one.

"Swim, run through the water," I explained.

An expression of absolute terror passed over her face.

"It is *tabu*," she replied. "It is death to enter."

"It is death to stay on this side," I told her.

"It is better to die at the hands of the Mena than at the hands of the Gods," she answered.

She meant it too. She would rather face certain death at the hands of those hideous savages than to enter the stream. There was only one thing to do and that was to look for a place where I could sell my life dearly. With this in mind, I started along the river bank looking for a depression which would shelter us from the spears of the Mena. We made our way through a clump of trees in front of us and it was my turn to cry out, only my cry was one of joy and not of apprehension. There, between the trees and the river bank, stood a familiar looking object—an Electronic Vibration Adjuster.

"We are saved, Awlo," I cried joyously as I raced for the machine. A glance showed me that it was my first model which I had sent, as I thought, to infinite smallness nearly a year before. I was puzzled for a moment at the fact that it had not shrunk to nothing, but I had no time for philosophical reasoning. The shouts of the Mena were already perilously close.

"Run off a few yards, Awlo," I commanded, "and don't be frightened. I can save you easily."

She obeyed me and I entered the adjuster. A momentary fear came over me that the batteries might be exhausted but I seized the switch and threw it on in the direction of increasing size. The landscape began to diminish its size, although as before, I could feel nothing. I kept my eye on the river until it had shrunk to a point where I knew that I could easily leap it and then I opened my switch and stepped out.

For a moment I could not see Awlo, but I detected her lying face downward on the ground. I bent over her and then I saw something else. The Mena, hundreds of them, had emerged from the jungle and were coming along our trail. I hesitated no longer. As gently as I could, I picked up Awlo and leaped over the river with her. I waited to see whether the Mena were going to make any attempt to follow, but they had evidently caught a glimpse of my gargantuan proportions and they were in full retreat. I found out later that the river was as much taboo to them as it was to Awlo and they would under no circumstances have crossed the stream except by means of a bridge or in boats.

I raised Awlo to the level of my eyes to talk to her but she had fainted. I leaped back to the other side of the river, reentered my adjuster and closed the reducing switch. Since I had the machine under control, I de-

terminated not to stop it until I found what had made it cease functioning when it did. My size rapidly grew smaller until I was correctly scaled to my surroundings and then the machine abruptly ceased working. I could not make it reduce either itself or me any further. The only explanation which has ever occurred to me is that the land of Ulm must be at the limit of smallness, that is, the period of vibration of the atoms and their component parts must be at the lower limit of motion and any further reduction would result in contact and consequent nothingness.

My intention had been to swim the river while Awlo was unconscious but it occurred to me that the adjuster might be useful on the other side of the river so I again increased my size until I could step over it. Knowing that the machine would only get so small, I reached in with a piece of wood and closed the reducing switch and watched it grow to toy size. With it in my hand, I again leaped the river and used my pocket knife blade to close the increasing switch. When it had grown to the right size, I stopped it, reentered it and soon had both the adjuster and myself down to the minimum to which it would go.

AWLO was still unconsciousness and I bent over her and chafed her hands. She soon recovered and sat up. Her gaze wandered and it fell on the adjuster, she shuddered and turned to me with fear in her eyes.

"What happened, Courtney Siba?" she asked with a quaver in her voice. "I thought that you had changed into a *kahuma*, a wizard of the old days. Was I dreaming?"

I thought rapidly. Evidently a *kahuma* was something to be revered but also something not quite human. The advantages and disadvantages of being one flashed before me but a glance at Awlo's scared face decided me.

"I am no *kahuma*, Awlo," I replied. "What I did, I did with the aid of that. It made me appear to the Mena to be larger than I am and they ran. While they were gone, I carried you and the machine over the river. We are perfectly safe now and unless the Mena find some way of crossing, they won't bother us again."

Awlo seemed satisfied with my explanation. I suggested that she rest for a while to recover from her scare but she laughed at the idea.

"Ulm is near at hand," she told me, "and we must hurry on. I would not that my father be unduly worried by my absence."

"That reminds me of something I have been meaning to ask you, Awlo," I said as we resumed our onward way. "How did you happen to be in the jungle with the Mena after you when I found you?"

"I was visiting my uncle, Hama, at his city of Ame," she replied. "My visit was at an end and I started homeward yesterday. It has been three years since the Mena have ventured to attack us and the guard was small, only about three hundred soldiers. We were about half way between the two cities and were going peaceably through the jungle when, without warning, the Mena attacked. The soldiers fought desperately but the Mena were too many and too powerful for them and they were all killed. I and two of my maidens were captured. The Mena took us to one of their cities in the jungle and prepared for a feast."

"For a feast?" I inquired.

"We are food for the Mena," she replied simply.

I shuddered at the thought and gritting my teeth as I thought of those flying monsters who were at my mercy a few minutes before. Had I known what brutes they were, I could have taken glorious vengeance on them.

"Last night," went on Awlo, "they took first one and then the other of my maidens out from the cake where we were confined, and killed them and dragged them away to the pot. My turn was next and two of them seized me and dragged me out. They released me and one of them raised a spear to end my life. I dropped to the ground and the spear passed over my head and then I fled. I tried to run toward Ulm, but they suspected the course I would pursue and a party went to head me off while others followed my trail. As long as it was dark I was able to baffle them and go faster than they could trail me, but with the coming of light they found my trail and soon I heard them after me. I ran as fast as I could, but they gained rapidly and I thought that I was lost when I heard your shout. Awlo Sibu Tam will never forget how you saved her and neither will Ulm. My father, Kalu, will honor you highly, Courtney Siba."

"If these Mena are such brutes, why don't your soldiers wage war on them until there are none left?" I asked.

"They have waged war for ages," she replied, "but the Mena are too many and we cannot hunt them all down. In ages past, there were no Mena and then Ulm and Ame fought together. Sometimes one would be victorious and sometimes the other, but always they ceased warring before either was destroyed. Then came the Mena through the passes from the wilderness to the north. They came in thousands and they attacked Ame. The men of Ulm forgot their hatred of their old rival and our armies marched to the assistance of the threatened city. For a time our armies drove the invaders back but more and more came from the north and carried the battle to the gates of Ame itself. There our armies stopped them for they could not climb the walls nor could they break in.

"When they saw that they could not win the city, they attacked Ulm. Our army hurried back to defend the city and the men of Ame came with them, leaving only enough to man the walls. Again the Mena fought their way to the city walls and again they were stopped. When they found they could not take either city, they drew back into the jungle and established cities of huts. Such is the condition today. The Mena fight among themselves and when they are weakened in numbers, the armies of Ulm and Ame march out to attack them. They have always defeated them and tried to hunt them down and sometimes for a generation the Mena are not seen, but eventually they return stronger than ever and attack one of the cities. It has been many years now since war was waged on them and it may be that they are planning to attack again."

"Do Ulm and Ame ever fight now?" I asked.

"No, there is peace between them. Brothers of one blood sit on the two thrones and the old enmity is forgotten. But see, there lies Ulm!"

We had topped a little rise and had come to the cultivated fields. Before us lay row after row of cultivated plots, most of them planted with *keili* bushes, the nut of which is the staple food of the poorer classes of Ulm

Two miles or so across, the plain rose a massive walled city. Dotted about on the plain were small stone structures, which reminded me of the old blockhouses which used to be erected on our own plains to guard against Indian raids. That, in fact, was the exact function of these structures.

As we approached the nearest of them a figure appeared on the wall and scrutinized us closely. He called out a musical greeting and Awlo raised her face.

"Awlo Sibi Tam commands your presence," she cried imperiously.

The sentry rubbed his eyes and looked and then came down from that wall in a hurry. The massive gates swung open and an officer appeared and prostrated himself and kissed the ground before Awlo.

"Rise!" she commanded.

He rose and half drew his sword from its sheath and presented the hilt to Awlo. She touched it and he returned it to its scabbard with a sharp motion and stood upright.

"I would go to Ulm," she said. "Send couriers to warn my father of my approach and bid my guard come hither to escort me."

He bowed deeply and Awlo took me by the hand and led me into the building. It was a typical guardroom such as are found in all nations and at all times. We seated ourselves and I heard the sound of hoof-beats rapidly dying away in the direction of the city.

"Who are you, Awlo?" I asked. "Are you a Chief's daughter or what?"

"I am Sibi Tam," she replied.

"I don't know that rank," I answered, "How important is it?"

She looked at me in surprise and then laughed.

"You will find out in time, Courtney Siba," she said with a laugh.

I tried to press the question but she refused to answer and turned the talk to other matters. Half an hour passed and then I was aware of a confused murmur approaching from the city. Awlo rose.

"It is doubtless our escort," she said. "Let us greet them."

I followed her out into the courtyard and up on the thick wall which surrounded the building. Coming down the road was the most gorgeous cavalcade I had ever seen. First came a band of cavalry mounted on superb horses and carrying long lances. They wore golden helmets with nodding crimson horsehair plumes rising from them, a cuirass of gold and golden shin guards. Their thighs were bare. Besides the armor they wore a short crimson garment like a skirt, which fell half way to the knee and a flowing crimson cape trimmed with brown fur. Heavy swords on the left side of their belts and a dagger on the right, together with their twelve-foot lances made up their offensive weapons.

Following the cavalry came a number of gorgeously decorated chariots, occupied by men gorgeously dressed in every imaginable hue. Another troop of cavalry, similar to the first except that their plumes and clothing were blue, brought up the rear.

As the leading troop came opposite the gate, Awlo stepped to the edge of the wall. Her appearance was greeted by a roar of applause and salutation and the red cavalry reined in their horses and pointed their lances toward her, butt foremost. She answered the salute

with a wave of her hand and the troop charged forward at a word of command past the tower and then whirled to form a line facing her. The chariots came up and an elderly man dismounted from the first one and passed in through the gate. He came up the steps to the wall and dropped on one knee before Awlo, half drawing his sword and thrusting the hilt toward her as he did so.

She touched the sword and he returned it and rose to his feet.

"Greeting, Moka," she said. "Come with me for I desire a word with you."

Submissively he followed her a short distance along the wall and I could see that she was speaking rapidly. I could tell from the direction of Moka's glances that I was the topic of conversation, and his actions when Awlo had finished amply proved it. Moka came forward and drew his sword and cast it at my feet. I drew my pistol and placed it beside his weapon. Moka laid his left hand against my breast and I did the same.

"My brother and my lord," he said as he rose.

Awlo interrupted before I could say anything.

"I would go to Ulm," she said.

Moka bowed deeply and we each picked up our weapons. I followed Awlo toward the chariots. The largest and most ornate was empty and into it she sprang lightly, motioning to me to go with Moka in his chariot. I entered it and the whole cortège turned about and proceeded toward the city.

We drove in through a huge gate which was opened before us and down a wide thoroughfare which led directly into the center of the city. This avenue ended in a park in the center of which stood the largest and most beautiful building in the city. We left our chariots and made our way on foot across the park and entered the palace between rows of guards who, as Awlo passed, presented their spears, butt foremost.

At the end of the hall, Awlo paused.

"Courtney Siba," she said, "you are doubtless weary as I am. Go then with Moka, who will supply you with clothing fitting to your rank and with proper refreshment. My father will meet you when you have rested and reward you as you merit."

I had learned a little about the customs of Ulm and I dropped on one knee and presented her my pistol, butt first. She smilingly touched it and I rose and followed Moka. He led me up a flight of steps and into an apartment fit for a Prince of the Blood. Here he summoned servants and surrendered me to their tender mercies.

I did not realize how tired I was until a hot bath revealed the true extent of my fatigue. One of my servants approached and by motions indicated that I was to lie down on a couch. I did so and he massaged me thoroughly with a sweet-smelling oil, which banished my fatigue marvelously. When he had finished, other servants approached with garments which they evidently desired me to put on. I strove to talk to them but they merely shook their heads. Small wonder, for I later found that they were dumb.

The clothing which they brought me consisted of such a skirt, as I had seen on the soldiers, except that it was pure white. In addition they brought me a white cloak which hung well below the waist and which was fastened at the throat with a diamond the size of a walnut. On my feet they placed leather sandals which were thickly encrusted with gold and diamonds and around my calves they wound leather straps also heavily gemmed. About

my head they bound a golden fillet with a square cut diamond set in the center and around my waist they fastened a belt with a diamond buckle with a long straight sword hanging from the left and a heavily jeweled dagger from the right. As a final touch they set on my head a golden helmet somewhat like those I have seen on ancient Grecian coins, with a white horse-hair plume. When they had finished they stood me in front of a mirror to see if I was suited.

I was, in every respect except one. I dug into my old clothes and got my Colt and hung the holster on my belt instead of the silly dagger. It may not have been as handsome, but if I was going to need weapons where I was going, I knew which would be of the most value to me. When I signified that I was suited, my servants withdrew with many bows and left me alone.

I hardly knew what to expect next but I threw myself on the couch to rest a little. For close to an hour I waited before the door swung open to admit Moka.

"My lord," he said with a bow, "Kalu Sibama awaits your presence."

"I am ready," I replied as I rose.

As we passed through the doorway, a detachment of guards met us. As we appeared, they grounded their spears with a ringing clash and closed around us. We passed down a corridor and down a flight of stairs to the main entrance hall and across it to a great closed double door, where we were halted by another detachment of guards and challenged. Moka answered the challenge and the great doors swung open and there was a peal of trumpets. When they had ceased a sonorous voice called out some words which I did not understand, although I was pretty sure that I caught the words "Awlo" and "Courtney." It was evidently an introduction, for, when the voice ceased, Moka motioned me to go forward. I stepped out with my head held high. The guards went with me for a few paces and then opened out and formed a line, leaving me to advance alone down the hall.

It was an immense and spacious hall and while the center was open, the sides were crowded with gaily dressed people. Guards were on all sides and at the far end was a dais or platform raised seven steps above the floor. On the topmost level were four thrones. Before the throne, on the various levels, were a number of men and women, dressed in every color imaginable except the green which was worn by the occupants of the thrones. On the step next to the top level stood a lone figure, who also wore green.

Down the hall I marched until I stood at the foot of the dais. I heard a murmur run down the hall as I passed, but whether of approval or disapproval I could not tell, so I went straight ahead until I came to the foot of the dais and then I bowed deeply. I looked up and looked the occupants of the thrones straight in the eye.

The two center seats were occupied by an elderly couple of great grace and dignity of manner, the throne on the right was vacant and in the one on the left sat Awlo. I had known by the respect accorded her that she must be a rather important personage, but it startled me to realize that she was one of the biggest of them all. She threw me a momentary smile and then looked at me gravely and impersonally as the other two were doing.

The man who occupied one of the center thrones rose and spoke to me.

"Courtney Siba," he said gravely in a sonorous and ringing voice, "My daughter has told before me, where all could hear, the mighty deeds which you have wrought against the Mena. And you who have saved her, in whom the hopes of the dynasty of Kalu are bound up, merit and will receive the gratitude of a nation. The gratitude of a father for the life of his only child I freely give you.

"There is no reward within my power to grant that is great enough for your merits, but if you will name your wishes, they shall be yours if Ulm can supply them. Your rank of Siba I hereby confirm in Ulm and Ame and give orders that your rank is above all others in the empire save only the royal blood. Is there any reward you desire?"

"I thank you, oh King," I replied, "and I will bear your gracious words in mind. Already you have honored me above my poor deserts but the time may come when I will remind you of your words."

"My words are engraven on my memory, Courtney Siba," said the King with a gracious smile, "and time will not erase them. Your rank entitles you to a place on the second level of my throne, below only my beloved nephew, Lamu Siba."

He motioned toward the man who stood on the next to the topmost level and who I noticed was attired in green as was Kalu. I glanced at him and found that he was watching me with a face like a thundercloud. I returned the scowl with interest and took stock of him. He was about two inches shorter than I was and ruggedly built and showed evidence of a great deal of strength. His black hair, which like the hair of all the men of Ulm, was worn long enough to reach his shoulders, matched the swarthy complexion. The thing that set me against him was a crafty expression in his close set eyes, which were grey instead of the honest brown or black which should have gone with his complexion.

At a gesture from the King (or Sabama as his title really was), I mounted the dais and took my stand on the step below Lamu and directly in front of Awlo. When I had taken my place, the Sabama turned to the court and began again in his sonorous voice what was evidently a regularly recited formula.

"The house of Kalu," he said, "is as a withered tree with but one green branch. Should this branch be cut, the tree would die without trace of life remaining. Already the branch has been almost cut. It is the hope of all Ulm that this branch will make that new life may be given to the tree, yet the immemorable laws of Ulm decree that the Sibi Tam shall be free to choose her own husband when and how she will, nor may even the Sabama force her choice. Awlo, my daughter, the green branch of the tree of the house of Kalu, are you yet ready to declare your choice?"

Awlo rose and stepped forward.

"I am," she declared in ringing tone.

The reply made a sensation. The audience had been listening politely to the words of the Sabama but they evidently expected Awlo to say that she had not yet made up her mind and her reply electrified them. A hastily suppressed murmur ran through the hall and the Sabama started. I noticed that Lamu bit his lip and closed his hand on his dagger hilt.

"Whom, my daughter, have you chosen to be your prince?" asked Kalu.

Awlo stepped down two steps and stood beside me.

"When the branch was about to be cut, one arose who stayed the hand of the Mena and who saved the tree from being a desolate dying trunk today. Who but that one should be chosen to the highest honor in Ulm and as her future ruler. My father, for my husband, I choose Courtney Siba."

As she ended, she took my right hand and raised it high above my head. There was a moment of silence and then cheer after cheer rent the hall. Evidently Awlo's choice was popular. The Sabama stepped forward and held up his hand for silence. The uproar instantly hushed and he started to speak. He was interrupted in a dramatic manner.

SWORD in hand, Lamu faced him. "Grant you permission to the Sibi Tam to make such a choice?" he demanded.

"The Sibi Tam chooses whom she pleases," said Kalu sharply. "Sheath your weapon. You are in the presence of the Sabama."

"My weapon remains drawn until the honor of Ame is avenged," cried Lamu hoarsely. "Have you lost your senses, my uncle, that you give your only child, the pride and hope of Ulm, to a nameless adventurer who comes from no one knows where? Who knows that he is not a *kahuma* who will destroy the land? Awlo says that he slew the Mena by witchcraft."

"Awlo has chosen," said Kalu quietly but with an ominous ring in his voice. "By what right do you assume to question her choice?"

"For years I have sought her, seeking to consolidate the rule of Ulm and Ame," replied Lamu, "and until this stranger came into Ulm, I had reason to think that my suit was favored. Are you seeking, my uncle, to raise a barrier of blood between Ulm and Ame that the Mena may destroy both?"

"What mean you?" thundered Kalu.

"I demand that the stranger be tested before the Court of Lords to prove that he is not a *kahuma*."

"And Lamu presides over the Court of Lords," broke in Awlo with biting sarcasm. "Do you expect me to let my chosen go before your creatures for judgment?"

The shot struck home and Lamu bit his lips.

"Do you approve Awlo's choice?" he demanded of the Sabama.

"I do," was the reply.

"Then I call upon the ancient laws of Ulm for redress. It is the right of every Siba of royal blood to challenge and fight to the death with the choice of the Sibi Tam. You, Courtney, who claim the rank of Siba, I challenge you to fight to the death."

"Courtney Siba," said Kalu gravely, "do you accept this challenge? Either you must give up your rank or fight for it."

I hesitated but Awlo touched me on the arm. I looked at her and she glanced meaningly at my pistol. An idea came to me.

"I will gladly fight him," I cried, "but not to his death. If he overcomes me, he may do as he wishes, but I fight with my own weapons and if I overcome him, I spare his life."

"Then draw your weapon, Courtney Siba and defend yourself," cried Lamu as he rushed forward.

He aimed a vicious thrust at me before I had time to draw my own weapon and I avoided it only by leaping nimbly back. He came on again and I side-stepped and

whipped out my Colt. As he rushed me the third time, I raised my weapon and fired. As I have said, I am a good shot and the range was close, so I didn't shoot to kill. Instead I fired at his sword hand and was lucky enough to hit the hilt of his weapon. The heavy forty-five bullet tore his sword from his grasp and sent it flying through the air. I instantly sheathed my pistol and waited for his next move. It came quickly enough.

He rubbed his right hand for a moment; it must have stung damnably, and then he whipped out his dagger and came at me with it in his left hand. I was a little taller than he was and had the reach on him so I met him half way. He made a sweep at me with his knife which I avoided and then I took his measure and landed my right full on the point of his chin and he went down like a poled ox. A tremendous murmur went around the room and then came a volley of cheers. I judged that Lamu was not popular. When the noise subsided, the Sabama spoke.

"Does any one else wish to challenge the choice of the Sibi Tam?" he asked sardonically.

There was no reply and he nodded to Awlo. She stepped forward and took my right hand in hers and turning it over, she kissed me on the palm and then set my hand on top of her head. When she had finished the ceremony, she looked expectantly at me. I wasn't exactly sure what to do so I took her hand and kissed it and then placed it on top of my head as she had done. In a moment her arms were around me and the assembly room rang with cheers.

Presently Awlo drew back and the Sabama stepped down from his throne. Some officers came forward and removed my white cloak and replaced it with a green one and the Sabama himself bound about my brow a golden fillet with a square cut stone in it, similar to the ones which he and Awlo wore, and took me by the hand and led me up the dais and seated me on the vacant throne. There came another blare of trumpets and then the Sabama formally addressed me as "Courtney Siba Tam." Thus it was that I, Courtney Edwards, a citizen of the United States of America, in the year of our Lord one thousand, nine hundred and twenty-two became a Prince of the House of Kalu, the Crown Prince of the Empire of Ulm and the husband of the reigning monarch's only child.

I quickly became settled in my position of Siba Tam. My first official task was to pronounce judgment on Lamu. When I learned the circumstances, I hardly blamed him for his outburst. He was the only son of the ruler of Ame and he had been Awlo's suitor for years. By virtue of his rank he was Commander-in-Chief of the combined armies of Ulm and Ame and when he saw me, a stranger, come in and oust him from his proud position and take his sweetheart as my wife into the bargain, he lost his head. The Sabama wished to reduce him to the grade of commoner and confine him, but Awlo and I interceded and he was eventually pardoned and I appointed him as my second in command of the army. Whatever his faults, he was a good soldier and quite popular with the military. He acted rather formally to me for a couple of years, but he got over it and became one of my closest friends.

One of my first acts was to send a detail of troops out to bring my adjuster into Ulm. There I drained the batteries and went over it thoroughly and stored it in the palace vault. I was perfectly happy and had no idea

at all of ever leaving Ulm, but I was guarding against accidents. At any time some prospector might find my valley and wash out a pan of dirt and dump the rubbish on Ulm. If that happened, I meant to take Awlo and increase our size and break up through it.

For five years everything was quiet and peaceful in Ulm and Awlo and I were the happiest pair in the whole empire. She was the idol of the city and my rescue of her had given me a good start. I soon grew quite popular and when Lamu grew to be my friend, the army joined the populace in their effection for me.

In the fall of 1927 we first began to get rumors of a great gathering of the Mena. At first both Lamu and I were disposed to scout the idea, but the rumors came with more definiteness and at last we had to face the fact that the Mena were gathering for an attack in real force. We made what preparations we could for the siege and waited for them to attack. One of the peculiar things which had struck me about Ulm was that the art of projecting weapons was unknown to them. Even the crudest bow and arrow had not been developed. I thought that I saw my way clear to thrash the Mena handsomely and I made up a bow and arrow and showed it to Kalu, proposing that our army be so equipped. He smiled enigmatically and advised me to lay it before the council.

I did so and to my surprise Lamu and the council would not listen to the suggestion. When they explained their reasons, I saw that they were sound ones. The Mena, while they have no inventive ability, are adept at copying the ideas of others and the council were afraid that, while we might smash the first attack by fire superiority, on the next attack we would find the Mena armed with bows, and in such a case we would suffer heavily, even if we finally beat off the attack. The principle of the bow and arrow were well known to them, but they had never used it for this reason.

ABOUT a year ago the Mena attacked. There were millions of them, it seemed to me, and they were utterly reckless and willing to put up with huge losses to gain a small point. Man for man they were our superiors, so we did not meet them outside the walls, but contented ourselves with defending the city. They brought ladders and tried to climb the walls and they brought rams and tried to batter down the gates and we stood on the walls and dropped rocks on them and poured hot oil on them and when they got a ladder hoisted we hurled it back and killed with sword and spear those who had gained a footing on the walls. I had read of such defenses in history, and I was able to introduce a few new wrinkles which gave the Mena some rather unpleasant surprises. After three months of fighting, the situation hadn't changed a bit. I learned that a siege of ten or even twenty years was nothing unusual. We had enough *keili* nuts stored in the city to last for fifty years and we had an abundant supply of water. We weren't strong enough to take the offensive, so all we could do was to defend ourselves and wait until the Mena got tired and quit or got to fighting among themselves; the latter always happened when the siege drew out to too great a length.

The continual fighting kept me away from Awlo a great deal and I was naturally anxious to end it as soon as possible. As I passed the arsenal one day, I saw my adjuster standing there and a great idea struck me. I

was confident that if I could use propelled projectiles, I could break the back of the Mena attack in no time. The council wouldn't let me use bows and arrows for fear our enemies would copy them and use them against us, but I defied any artisan of the Mena, or any artisan of Ulm for that matter, to copy a modern rifle and its ammunition. Why couldn't I use the adjuster to increase my size to the plane where such things were to be had, load it with guns and ammunition and shrink the whole business to usable size. I hastened to lay my idea before Kalu and the council.

I doubt whether any of the council had ever believed the story I told of my origin, although they had never said so. It is never safe to dispute the word of those in high authority. When I soberly offered to increase my size and get them guns and ammunition, they shook their heads and began to wonder. I took them up on the wall and showed them what a rifle would do to the Mena and any opposition to my going vanished. Highly elated, I refilled my batteries with the electrolyte I had drawn years before and got ready for the trip. I soon found that I had reckoned without Awlo. My Princess flatly refused to be separated from me.

For a while I was baffled but Awlo herself suggested a solution of the problem she had raised.

"Why can't I go with you, Courtney?" she asked. "If we come back safely, the trip will be an interesting one and if we do not return, at least we will be together."

The idea had merit and I presented it to Kalu. He didn't like Awlo to leave him, but he gave consent at last on my solemn promise to come back with her. I knew that some of the work up here would be rather heavy and I asked for a volunteer to accompany me. To my surprise, Lamu asked to go. I was glad of his company but I didn't want both the head of the army and the second in command to leave at once. He insisted and pointed out that the danger of the trip should be shared by the two highest ranking men in the army and I gave way and consented.

The adjuster was carried to the palace roof and I made a few adjustments to increase the speed of its action so that it wouldn't crush the whole city beneath its weight before the base expanded enough to get a wider support. At last everything was ready and the three of us crowded in and with final farewells to all I closed the switch.

I had set the machine to work faster than I realized and before I could open the switch we were twelve feet tall. I threw it back into slow speed and reduced our size until the indicator showed that I was my normal six feet and we stepped out into a new world to Awlo and Lamu and almost a new one to me.

We went into my shack and looked it over. Nothing had been disturbed and no one had been there, so there was no reason why Awlo couldn't stay there safely while Lamu and I trekked into Beatty and I got in touch with my bankers and arranged to buy the munitions that I wanted. We talked it over and Awlo wanted to come. There was no real reason why she couldn't come and indeed make a trip to New York with me if she wished, so I agreed to her coming. Lamu suggested that it might be a good idea for me to teach him how to operate the adjuster so that, in case we found it advisable to send the stuff down in several loads, he could take it down and return and thus avoid separating Awlo

and me. The thought was a good one so I set the machine on slow speed and soon taught him the simple manipulation. He caught on readily and manipulated it several times to quite a small size and then professed himself satisfied with his ability. I wish that I could have seen what was in the black villain's heart!

The next morning I was in the cabin making up packs for us to carry on our hike to Beatty when I was alarmed by a scream from Awlo outside. I dropped everything and rushed out at top speed. For a moment I didn't see either her or Lamu and then I heard a low faint wail in her voice. I looked in the direction from which it came and saw the adjuster. It was less than one-tenth the size it should have been and I realized that it was shrinking. I sprinted toward it hoping to reach the switch and reverse the action, but I was too late. On my hands and knees I dropped and stared into it. Lamu had my Princess captive and his hand was on the switch. He stopped the action for a minute but the thing was already so small that I could not get my finger between the side bars had I tried and I was afraid of wrecking it. Stooping closer, I heard their tiny voices.

"Courtney Siba Tam," cried Lamu with triumph in his voice, "he laughs best who laughs last as I have heard you say. You robbed me of my kingdom once but when we return and tell them how you planned to desert Ulm in her hour of need and to steal away her Princess, I shall win back all I have lost. For years I have planned to thwart you in your ambition and for that reason I throttled my impulses and seemed your friend. Say farewell to Awlo for this is your last glimpse of her."

"Awlo," I cried in a whisper, "can't you free yourself?"

"No, Courtney," came back her tiny voice, "he is too strong for me and I dare not struggle. Come after me, Courtney! Rescue me from this dog who is worse than the Mena from whom you saved me once. I will watch

for you, Courtney!" Thus I heard her voice for the last time and responded.

"I'll be after you as soon as I can, my darling," I cried. "As for you, Lamu Siba, the game is not played out yet. When I return, your heart's blood will pay for this!"

"Ah, yes, Courtney Siba Tam," came his mocking voice, "when you return."

He turned again to the switch and the adjuster carrying with it all that is dear in life to me disappeared.

I don't remember much about the next few days. Somehow, I made my way to Beatty and established my identity. I made the wires hum to San Francisco, ordering the materials I needed to construct a duplicate of my adjuster. Nor did I forget my people. I ordered the guns and ammunition which I wanted shipped in with the rest of my stuff. It seemed to take forever to get to my valley, but at last it came and I have worked almost day and night since. This afternoon I finished my apparatus and moved it over to the spot where the other had stood and in the morning I will leave this plane and try to take my guns and ammunition to Ulm.

I hope to land in Ulm but I am not at all sure that I will do so. I marked the place where my former machine stood but I may have easily missed placing my new model over the old ones. If I have missed setting the center point where it should be by even a fraction of an inch I may come down in Ulm miles from the city. I may even come down into a strange world far from my empire and with no knowledge of which way to go. I have done my best and time alone will tell how well I have done. One thing I know. No matter what Lamu may have done or said, Awlo is still waiting for me and she is still true to me. I have my rifle and plenty of ammunition and even though the whole Mena race block my path, some way I will fight my way through them and once more hold my Princess in my arms.

THE END

Evolution

Long have wise folk a baffling secret sought—
The mystery of human origins.
A theory rises—sinks; another wins
A transient credence. Some men will have naught
Of simian kin, nor bear the shocking thought
Of simple earthly sources of our sins
And virtues. These are valiant paladins.
But by slight hints may not deep truths be taught?

Often when strolling idly out of doors
The joy of upright carriage thrills me through—
As though in some dim past I'd gone "all-fours"!
And often speech, or victory in some test
Of wits, stirs quick surprise, a wonder new,
*As though I'd once lacked language, groped,
and guessed!*

—JULIA BOYNTON GREEN.

*Continuing a Thrilling New Serial
of Interplanetary Life and Travel
by Edward E. Smith, Ph.D.
Author of "Skylark of Space," and "Skylark Three"*

PART II

Spacehounds of IPC

ONE of the most fascinating mysteries of the heavens is the comet. It goes through space, gets near enough to the earth to be seen, and then goes off and disappears in celestial distance. Often it has a hyperbolic orbit, which would make it impossible to come back. Yet it may return—apparently contradicting the geometry of conic sections. This only goes to prove once more that it is risky to say anything is impossible—even that our hero of this story manages beautifully, with the aid of Cantrell's Comet, to avoid complete annihilation while stranded in interstellar space.

Read "what went before" and then continue the second instalment.

What Went Before:

THE Interplanetary Vessel Areturus sets out for Mars, with Breckenridge as chief pilot, carrying on board, besides its regular crew and some passengers, the famous Dr. Stevens, designer of space ships and computer. He checks computations made by astronomers stationed in floating observatories, and after he has located any trouble and suggests a plan for minimizing the hazards of the trip from the earth to Mars, he reports his findings and suggestions to Mr. Newton, chief of the Interplanetary Corporation.

Stevens then takes Nadia, Mr. Newton's beautiful young daughter, on a specially conducted sight-seeing tour of the Areturus and thoroughly explains to her all of the works of the vessel. Nadia has herself had a good science education. While they are down at the bottom of the ship—nearing the end of their tour—Stevens feels a barely perceptible movement of the vessel from its course. When he turns on the visiplute, he is horrified to find that a mysterious ray of unparalleled power has neatly sliced the Areturus in several places.

Nadia and Stevens are completely separated from the rest of the crew and passengers of the ship, so they get into a life-boat, which is equipped for a limited amount of space travel. Despite the strict and apparently effective vigilance of the enemy destroyer, Stevens and Nadia make their getaway in the life-boat, which they aptly call "Forlorn Hope," and finally make a safe landing on Ganymede, where Stevens plans to build a power-plant and a radio transmitter, to enable him to communicate with the earth or with the IPV Sirus, which is used by Westfall and Brandon (two of the world's best scientists) as a floating laboratory.

With the very scant apparatus and material available, Stevens sets to work on his power plant. Just as they have it completed and ready to start for Cantrell's Comet, where Stevens believes he can obtain the necessary metal for his giant transmitting tube, they experience a close call with carnivorous plants on the satellite and later with savage inhabitants, which precipitates their trip to the comet.

CHAPTER V

Cantrell's Comet

FARE out in space, Jupiter, a tiny moon and its satellites mere pin-points of light, Stevens turned to his companion with a grin.

"Well, Nadia, old golf-shootist, here's where we turn spacehounds again. Hope you like it better this time, because I'm afraid that we'll have to stay weightless for quite a while." He slowly throttled down the mighty flow of power, and watched the conflicting emotions play over Nadia's face in her purely personal battle against the sickening sensations caused by the decrease in their acceleration.

"I'm sorry as the dickens, sweetheart," he went on, tenderly, and the grin disappeared. "Wish I could take it for you, but . . ."

"But there are times when we've got to fight our own battles and bury our own dead," she interrupted, gamely. "Cut off the rest of that power! I'm not going to be sick—I won't be a—what do you spacehounds call us poor earth-bound dubs who can't stand weightlessness—weight-fiends, isn't it?"

"Yes; but you aren't . . ."

"I know I'm not, and I'm not going to be one, either! I'm all x, Steve—it's not so bad now, really. I held myself together that time, anyway, and I feel lots better

now. Have you found Cantrell's Comet yet? And why so sure all of a sudden that they can't find us? That power beam still connects us to Ganymede, doesn't it? Maybe they can trace it."

"At-a-girl, ace!" he cheered. "I'll tell the world you're no weight-fiend—you're a spacehound right. Most first-trippers, at this stage of the game, wouldn't be caring a whoop whether school kept or not, and here you're taking an interest in all kinds of things already. You'll do, girl of my heart—no fooling!"

"Maybe, and maybe you're trying to kid somebody," she returned, eyeing him intently. "Or maybe you just don't want to answer those questions I asked you a minute ago."

"No, that's straight data, right on zero across the panel," he assured her. "And as for your questions, they're easy. No, I haven't looked for the comet yet, because we'll have to drift for a couple of days before we'll be anywhere near where I



Illustrated by
WESSO

At the bottom of a shaft a section of the rocky wall swung aside, revealing the yawning black mouth of a horizontal tunnel. At intervals upon its roof there winked into being almost invisible points of light. Along that line of lights the life-boats felt their way, coming finally into a huge cavern . . .

think it is. No, they can't trace us, because there is now nothing to trace, unless they can detect the slight power we are using in our lights and so on—which possibility is vanishingly small. Potentially, our beam still exists, but since we are drawing no power, it has no actual present existence. See?"

"Uh-uh," she dissented. "I can't say that I can quite understand how a beam can exist potentially and yet not be there actually enough to trace. Why, a thing has to be actual or not exist at all—you can't possibly have something that is nothing. It doesn't make sense. But lay off those integrations of yours, please," as now armed with a slate-pencil, Stevens began to draw a diagram upon a four-foot sheet of smooth slate. "You know that your brand of math is over my head like a circus tent, so we'll let it lie. I'll take your word for it, Steve—if you're satisfied, it's all x with me."

"I think I can straighten you out a little, by analogy. Here's a rough sketch of a cylinder, with shade and shadow. You've had descriptive geometry, of course, and so know that a shadow, being simply a projection of a material object upon a plane, is a two-dimensional thing—or rather, a two-dimensional concept. Now take the shade, which is, of course, this entire figure here, between the cylinder casting the shadow and the plane of projection. You simply imagine that there is a point source of light at your point of projection: it isn't really there. The shade, then, of which I am drawing a picture, has only a potential existence. You know exactly where it is, you can draw it, you can define it, compute it, and work with it—but still it doesn't exist; there is absolutely nothing to differentiate it from any other volume of air, and it cannot be detected by any physical or mechanical means. If, however, you place a light at the point of projection, the shade becomes actual and can be detected optically. By a sufficient stretch of the imagination, you might compare our beam to that shade. When we turn our power on, the beam is actual; it is a stream of tangible force, and as such can be detected electrically. When our switches here are open, however, it exists only potentially. There is no motion in the ether, nothing whatever to indicate that a beam had ever actually existed there. With me?"

"Floundering pretty badly, but I see it after a fashion. You physicists are peculiar freaks—where we ordinary mortals see actual, solid, heavy objects, you see only empty space with a few electrons and things floating around in it; and yet where we see only empty space, you can see things 'potentially' that may never exist at all. You'll be the death of me yet, Steve! But I'm wasting a lot of time. What do we do now?"

"We get busy on the big tube. You might warm up the annealing oven and melt me that pot of glass, while I get busy on the filament supports, plate brackets, and so on." Both fell to work with a will, and hours passed rapidly and almost silently, so intent was each upon his own tasks.

"All x, Steve," Nadia broke the long silence. "The pyrometer's on the red, and the oven's hot," and the man left his bench. Taking up a long paddle and an even longer blow-pipe, he skimmed the melt to a dazzlingly bright surface and deftly formed a bubble.

"I just love to talk at you when you've got your mouth full of a blowpipe." Nadia eyed him impishly and tucked her feet beneath her, poised weightless as she was. "I've got you foul now—I can say anything I want to, and you can't talk back, because your bubble

will lose its shape if you do. Oh, isn't that a beauty! I never saw you blow anything that big before," and she fell silent, watching intently.

Slowly there was being drawn from the pot a huge, tapering bulb of hot, glistening glass, its cross-section at the molten surface varying as Stevens changed the rate of draw or the volume of air blown through the pipe. Soon that section narrowed sharply. The glass-blower waved his hand and Nadia severed the form neatly with a glowing wire, just above the fluid surface of the glass remaining in the pot. Pendant from the blowpipe, the bulb was placed over the hot-bench, where Stevens, now begoggled, begloved, and armed with a welding torch, proceeded to fuse into the still, almost plastic, glass sundry necks, side-tubes, supports and other attachments of peculiar pattern. Finally the partially assembled tube was placed in the annealing oven, where it would remain at a high and constant temperature until its filaments, grids, and plates had been installed. Eventually, in that same oven, it would be allowed to cool slowly and uniformly over a period of days.

THUS were performed many other tasks which are ordinarily done either by automatic machinery or by highly skilled specialists in labor—for these two, thrown upon their own resources, had long since learned how much specialization may be represented by the most commonplace article. Whenever they needed a thing they did not have—which happened every day—they had either to make it or else, failing in that, to go back and build something that would enable them to manufacture the required item. Such setbacks had become so numerous as to be expected as part of the day's work; they no longer caused exasperation or annoyance. For two days the two jacks-of-all-trades worked at many lines and with many materials before Stevens called a halt.

"All x, Nadia. It's time for us to stop tinkering and turn into astronomers. We've been out for fifty I-P hours, and we'd better begin looking around for our heap of scrap metal," and, the girl at the communicator plate and Stevens at their one small telescope, they began to search the black, star-jeweled heavens for Cantrell's Comet.

"According to my figures, it ought to be about four hours right ascension, and something like plus twenty degrees declination. My figures aren't accurate, though, since I'm working purely from memory, so we'd better cover everything from Aldebaran to the Pleiades."

"But the directions will change as we go along, won't they?"

"Not unless we pass it, because we're heading pretty nearly straight at it, I think."

"I don't see anything interesting thereabouts except stars. Will it have much tail?"

"Very little—it's close to aphelion, you know, and a comet doesn't have much of a tail so far away from the sun. Hope it's got some of its tail left, though, or we may miss it entirely."

Hours passed, during which the two observers peered intently into their instruments, then Stevens left the telescope and went over to his slate.

"Looks bad, ace—we should have spotted it before this. Time to eat, too. You'd better . . ."

"Oh, look here, quick!" Nadia interrupted. "Here's something! Yes, it is a comet, and quite close—it's got a little bit of a dim tail."

Stevens leaped to the communicator plate, and, blond

head pressed close to brown, the two wayfarers studied the faint image of the wanderer of the void.

"That's it, I just *know* it is!" Nadia declared. "Steve, as a computer, you're a blinding flash and a deafening report!"

"Yeah—missed it only about half a million kilometers or so," he replied, grinning, "and I'd fire a whole flock of I-P check stations for being four thousand off. However, I could have done worse—I could easily have forgotten all the data on it, instead of only half of it." He applied a normal negative acceleration, and Nadia heaved a profound sigh of relief as her weight returned to her and her body again became manageable by the ordinary automatic and involuntary muscles.

"Guess I am a kind of a weight-fiend at that, Steve—this is much better!" she exclaimed.

"Nobody denies that weight is more convenient at times; but you're a spacehound just the same—you'll like it after a while," he prophesied.

Stevens took careful observations upon the celestial body, altered his course sharply, then, after a measured time interval, again made careful readings.

"That's it, all x," he announced, after completing his calculations, and he reduced their negative acceleration by a third. "There—we'll be just about traveling with it when we get there," he said. "Now, little K. P. of my bosom, our supper's been on minus time for hours. What say we shake it up?"

"I check you to nineteen decimals," and the two were soon attacking the savory Ganymedean goulash which Nadia had put in the cooker many hours before.

"Should we both go to sleep, Steve, or should one of us watch it?"

"Sleep, by all means. There's no meteoric stuff out here, and we won't arrive before ten o'clock tomorrow, I-P time," and, tired out by the events of the long day, man and maid sought their beds and plunged into dreamless slumber.

While they slept, the "Forlorn Hope" drove on through the void at a terrific but constantly decreasing velocity; and far off to one side, plunging along a line making a sharp angle with their own course, there loomed larger and larger the masses which made up the nucleus of Cantrell's Comet.

Upon awakening, Stevens' first thought was for the comet, and he observed it carefully before he aroused Nadia, who hurried into the control room. Looming large in the shortened range of the plate, their objective hurtled onward in its eternal course, its enormous velocity betrayed only by the rapidity with which it sped past the incredibly brilliant background of infinitely distant stars. Apparently it was a wild jumble of separate fragments; a conglomerate, heterogeneous aggregation of rough and jagged masses varying in size from grains of sand up to enormous chunks, which upon Earth would have weighed millions of tons. Pervading the whole nucleus, a slow, indefinite movement was perceptible—a vague writhing and creeping of individual components working and slipping past and around each other as they all rushed forward in obedience to the immutable cosmic law of gravitation.

"Oh, isn't that wonderful!" Nadia breathed. "Think of actually going to visit a comet! It sort of scares me, Steve—it's so creepy and crawly looking. We're awfully close, aren't we?"

"Not so very. We'd probably have lots of time to eat breakfast. But just to be on the safe side, maybe I'd

better camp here at the board, and you bring me over something to eat."

"All x, Chief!" and Stevens ate, one eye upon the screen, watching closely the ever-increasing bulk of the comet.

FOR many minutes he swung the *Forlorn Hope* in a wide curve approaching the mountain of metal ever and ever more nearly, then turned to the girl.

"Hold everything, Nadia—power's going off in a minute!" He shut off the beam; then, noting that they were traveling a trifle faster than the comet, he applied a small voltage to one dirigible projector. Darting the beam here and there, he so corrected their flight that they were precisely stationary in relation to the comet. He then opened his switches, and the *Forlorn Hope* hurtled on. Apparently motionless, it was now a part of Cantrell's Comet, traveling in a stupendous, elongated ellipse about the Master of our Solar System, the Sun.

"There, ace, who said anything about weight-funds? I was watching you, and you never turned a hair that time."

"Why, that's right—I never even thought about it—I was so busy studying that thing out there! I suppose I've got used to it already?"

"Sure—you're one of us now. I knew you would be. Well, let's go places and do things! You'd better put on a suit, too, so you can stand in the air-lock and handle the line."

They donned the heavily insulated, heated suits, and Stevens snapped the locking plugs of the drag line into their sockets upon the helmets.

"Hear me?" he asked. "Sound-disks all x?"

"All x."

"On the radio—all x?"

"All x."

"I tested your tanks and heaters—they're all x. But you'll have to test . . ."

"I know the ritual by heart, Steve. It's been in every show in the country for the last year, but I didn't know you had to go through it every time you went out-of-doors! Halves, number one all x, two all x, three all x. . . ."

"Quit it!" he snapped. "You aren't testing those valves! That check-up is no joke, guy. These suits are complicated affairs, and some parts are apt to get out of order. You see, a thing to give you fresh air at normal pressure and to keep you warm in absolute space can't be either simple or fool-proof. They've worked on them for years, but they're pretty crude yet. They're tricky, and if one goes sour on you, out in space, it's just too bad—you're lucky to get back alive. A lot of men are still out there somewhere because of the sloppy check-ups."

"Scuse it, please—I'll be good," and the careful checking and testing of every vital part of the space-suits went on.

Satisfied at last that the armor was spaceworthy, Stevens picked up the coils of drag-line, built of a non-metallic fiber which could retain its flexibility and strength in the bitter cold of outer space, and led the girl into the air-lock.

"Heavens, Steve! It's perfectly stupendous, and grinding around worse than the wreckage of the *Arc-turus* was when I wouldn't let you climb up it—why, I thought comets were *little*, and hardly massive at all!" exclaimed the girl.

"This is little, compared to any regular planet or satellite or even to the asteroids. There's only a few cubic kilometers of matter there, and, as I said before, it's a decidedly unusual comet. You know the game?"

"I've got it—and believe me, I'll yank you back here a lot faster than you can jump over there if any one of those lumps starts to fall on you! Is this drag line long enough?"

"Yes, I've got a hundred meters here, and it's only fifty meters over there to where I'm going. So long," and with a light thrust of his feet, he dove head foremost across the intervening space, a heavy pike held out ahead of him. Straight as a bullet he floated toward his objective, a jagged chunk many yards in diameter, taking the shock of his landing by sliding along the pike-handle as it head struck the mass.

Then, bracing his feet against one lump, he pushed against its neighbor, and under that steady pressure the enormous masses moved apart and kept on moving, grinding among their fellows. Over and around them Stevens sprang, always watching his line of retreat as well as that of his advance, until his exploring pike struck a lump of apparently solid metal. Hooking the fragment toward him, he thrust savagely with his weapon and was reassured—that object was not only metal, but it was metal so hard that his pike-head of space-tempered alloy steel did not make an impression upon its surface. Turning on his helmet light he swung his heavy hammer repeatedly but could not break off even a small fragment. "Found something, Steve?" Nadia's voice came clearly in his ears.

"I'll say I have! A hunk of solid, non-magnetic metal about the size of an office desk. I can't break off any of it, so I guess we'll have to grab the whole chunk."

He hitched the end of his cable around the nugget, made sure that the loops would not slip, and then, as Nadia tightened the line, he shoved mightily.

"All x, Nadia, she's coming! Pull in my drag line as I said over there, and I'll help you land her."

Inside the *Forlorn Hope* the mass of metal was urged into the shop, where Stevens clamped it immovably to the steel floor, before he took off his space-suit.

"Why, it's getting covered with snow, and the whole room is getting positively cold!" Nadia exclaimed.

"Sure. Anything that comes in from space is cold, even if it's been out only a few minutes, and that hunk of stuff has been out for nobody knows how many million years. It didn't get much heat from the sun except at perihelion, you know, so it's probably somewhere around minus two hundred and sixty degrees now. I'll have to throw a heater on it for half an hour before we can touch it. And since this is more or less new stuff to you, I'll caution you—don't try to touch anything that has just come in. That hammer or pike would freeze your hand instantly, even though they've been out only a little while. Before you touch anything, blow on it, like this, see? If your breath freezes solid on it, like that, don't touch it—it's cold."

UNDER the infra-beams of the heater, the mass of the metal was brought to room temperature and Stevens attacked it with his machine tools. Bit by bit the stubborn material was torn from the lump. Through heavy goggles he watched the incandescent mass in a refractory crucible, in the heart of the induction furnace.

"What do you think you've got—what you want?"

"I don't know. It wasn't iron—it wouldn't hold a

magnet. It's royal metal of some kind, I think. Base metals mostly melt at around fifteen hundred, and that crucible is still dry as a bone at better than seventeen."

"How are you going to separate out the tantalum and the others you want from the ones that you don't want?"

"I'm afraid that I'm not going to, very well," replied Stevens, with a wry grimace. "What I don't know about metallurgy would fill a library, and I'm probably the world's worst chemist. However, by a series of successive liquations, I hope to separate out fractions that I can use. Platinum melts somewhere around seventeen-hundred, tantalum about twenty-nine hundred, and tungsten not until way up around thirty-three or four hundred—and that, by the way, means lots of grief. Of course, each fraction will probably be an alloy of one kind or another, but I think maybe I'll be able to make them do."

"But mayn't that whole chunk be a pure metal?"

"It's conceivable, but not probable. There's she's beginning to separate at just below eighteen hundred! Platinum group coming out now, I think—platinum, rhodium, iridium, and that gang, you know. While I'm doing this, you might be getting those five coils into exact resonance, if you want to."

"Sure I want to," and Nadia made her way across to the short-wave oscillator and set to work.

After an hour or so, bent over her delicate task, she began to twitch uneasily, then shrugged her shoulders impatiently.

"What's the idea of staring at me so?" she broke out suddenly. "How do you expect me to tune these things up if you . . ." She stopped abruptly, mouth open in amazement, as she turned toward Stevens. He had not been looking at her, but he turned a surprised face from his own task at the sound of her voice. "Excuse me, please, Steve. I don't know what's the matter with me—must be getting jumpy, I guess."

"I wish that was all, but it isn't!" Face suddenly grim and hard, Stevens leaped to the communicator plate and shot the beam out into space. "There's an answer, but that isn't it. You're a fine-tuned instrument yourself, ace, and you've detected something. . . . I thought so! There's the answer—the guy that was looking at you!"

Plainly there was revealed upon the plate a small, spherical space-ship, very like the one that had attacked and destroyed the *Arcturus*. After Nadia had taken one glance at it, Stevens shut off the power and leaped out into the shop. He closed all the bulkhead doors and airbreak openings, then closed and secured the massive insulating door of the lifeboat in which they had made their headquarters. Then, after they had again put on the space-suits they had taken off such a short time before, he extinguished all the lights and hooded the communicator screen before he ventured again to glance out into the void.

"If I had a brain in my head, instead of the pint of bean soup I've got up there, we'd have worn these when they cut up the *Arcturus*, and saved us a lot of mental wear and tear," he remarked. "They were right there in the lockers all the time, and I knew it!"

"Well, we got away, anyway. You couldn't be expected to think of everything at once. We didn't have much time, you know."

"No, but I should have thought of anything as obvious as that, anyway. Wonder how they found us? Did they detect us, or did they come out to this comet after metal, same as we did, and find us accidentally? However, it all works out the same—they're apparently out to get

us. I'm afraid this is going to be a whole lot like a rabbit fighting back at a man with a gun; but we'll sure try to nibble us off a lunch while they're getting a square meal . . . here they come!"

The enemy sphere launched its flaming plane of force, and the *Forlorn Hope* shuddered in every plate and member as its apex was severed cleanly under the impact. Instantly Stevens hurled his only weapons. Flaming ultra-violet and dully glowing infra-red, the twin beams lashed out; but their utmost force was of slight moment to the enormous power driving the enemy screens. Two circular spots of cherry red in space were the only results of Stevens' attack, and the next fierce cut sheared away the two projectors and, incidentally, a full half of the fifty-inch armor of the leading edge.

"Then we're checking out now?" Nadia asked quietly, as the man's hands dropped from his useless controls. "I'm sorer than I can say, lover. But at least, I'm glad that I can go out with you," and her glorious eyes were shining with unshed tears.

"Maybe, but snap out of it, girl—our hearts are still beating! We're not dead yet, and maybe we won't be. Perhaps they want to capture us alive, as they did before; if so, we may be able to hide out on them somewhere and pull off another escape. Things don't look very bright, I know, but we're not checking out until our numbers are actually run up!"

He hooked a hand under her belt as the shocks came closer, and stood tense and ready. The lancing plane cut through one end of their control room, and Stevens leaped with his companion toward the new-made opening; while the air shrieked outward into space and their suits bulged suddenly with the abrupt increase in pressure differential. While they were in midflight, the frightful blade of destruction cleaved its way through the control board and through the spot upon which they had been standing a moment before. As they passed the severed edge, en route into open space, Stevens seized a metal brace and clung there, every nerve taut.

"Something funny here, Nadia," he said after a little, in a low tone. "They should have made one more cut, to make us absolutely blind and helpless. As it is, they've clipped off all our projectors, so we can't move, but I think we've got the whole control compartment of number two lifeboat untouched. If so, we can look around, anyway. Let's go!"

Floating without effort from fragment to fragment, they made their way toward the section of their cruiser as yet undamaged. They found an airlock in working order, and were soon in the second lifeboat, where Stevens hastily turned on a communicator and peered out into space.

"There they are! There's another stranger out there, too. They're fighting with her, now—that's probably why they didn't polish us off." Steel-braced, clumsy helmets touching, the two Terrestrials stared spell-bound into the plate; watching while the insensately vicious intelligences within the sphere brought its every force to bear upon another and larger sphere which was now so close as to be plainly visible. Like a gigantic drop of quicksilver this second globe appeared—its smooth and highly-polished surface one enormous, perfect, spherical mirror. Watching tensely, they saw flash out that frightful plane of seething energy, with the effects of which they were all too familiar, and saw it strike full upon the dazzling ball.

"This is awful, ace!" Stevens groaned. "They haven't got ray-screens, either, and without them they don't stand a chance. No possible substance can stand up under that beam. When they get done and turn back to us, we'll have to dive back to where we were."

BUT that brilliant mirror was not as vulnerable as Stevens had supposed. The plane of force struck and clung, but could not penetrate it. Broken up into myriads of scintillating crystals of light, intersecting, multi-colored rays, and cascading flares of sparkling energy, the beam was reflected, thrown back, hurled away on all sides into space in coruscating, blinding torrents. And neither was the monster globe offensive. The straining watchers saw a port open suddenly, emit a flame-erupting something, and close as rapidly as it had opened. That something was a projectile, its propelling rockets fiercely aflame; as smoothly brilliant as its mother-ship and seemingly as impervious to the lethal beams of the common foe. Detected almost instantly as it was, it received the full power of the savage attack. The hitherto irresistible plane of force beat upon it; ultra-violet, infra-red, and heat rays enveloped it; there were hurled against it all the forces known to the scientific minds within that fendishly destructive sphere.

Finally, only a scant few hundreds of yards from its goal, the protective mirror was punctured and the freight of high explosive let go, with a silent, but nevertheless terrific, detonation. But now another torpedo was on its way, and another, and another; boring on ruthlessly toward the smaller sphere. Fighting simultaneously three torpedoes and the giant globe, the enemy began dodging, darting hither and thither with a stupendous acceleration; but the tiny pursuers could not be shaken off. At every dodge and turn, steering rockets burst into furious activity and the projectiles rushed ever nearer. Knowing that she had at last encountered a superior force, the sphere turned in mad flight; but, prodigious as was her acceleration, the torpedoes were faster and all three of them struck her at once. There ensued an explosion veritably space-racking in its intensity; a flash of incandescent brilliance that seemed to fill all space, subsiding into a vast volume of tenuous gas which, feebly glowing, flowed about and attached itself to Cantrell's Comet. And in the space where had been the enemy sphere, there was nothing.

A slow-creeping pale blue rod of tangible force reached out from the great sphere, touched the wreckage of the *Forlorn Hope*, and pulled; gently, but with enormous power.

"Tractor beams again!" exclaimed Stevens, still at the plate. "Everybody's got 'em but us, it seems."

"And we can't fight a bit any more, can we?"

"Not a chance—bows and arrows wouldn't do us much good. However, we may not need 'em. Since they fought that other crew, and haven't blown us up, they aren't active enemies of ours, and may be friendly. I haven't any idea who or what they are, since even our communicator ray can't get through that mirror, but it looks as though our best bet is to act peaceable and see if we can't talk to them in some way. Right?"

"Right." They stepped out into the airlock, from which they saw that the great sphere had halted only a few yards from them, and that an indistinct figure stood in an open door, waving to them an unmistakable invitation to enter the strange vessel.

"Shall we, Steve?"

"Might as well. They've got us foul, and can take us if they want us. Anyway, we'll need at least a week to fix us up any kind of driving power, so we can't run—and we probably couldn't get away from those folks if we had all our power. They haven't blown us up, and they could have done it easily enough. Besides, they act friendly, so we'd better meet them half way. Dive!"

Floating toward the open doorway, they were met by another rod of force, brought gently into the airlock, and supported upright beside the being who had invited them to visit him. Apparently an empty space-suit stood there; a peculiarly-fitted suit of some partially transparent, flexible, glass-like material; towering fully a foot over the head of the tall Terrestrial. Closer inspection, however, revealed that there was something inside that suit—a shadowy, weirdly-transparent being, staring at them with large, black eyes. The door clanged shut behind them; they heard the faint hiss of intruding air, and the inner door opened; but their enveloping suits remained stretched almost as tightly as ever. They felt the floor lurch beneath their feet, and a little weight was granted them as the space-ship got under way. Stevens waved his arms vigorously at the stranger, pointing backward toward where he supposed their own craft to be. The latter waved an arm reassuringly, pressed a contact, and a section of the wall suddenly became transparent. Through it Stevens saw with satisfaction that the *Forlorn Hope* was not being abandoned; in the grip of powerful tractor beams, every fragment of the wreckage was following close behind them in their flight through space.

STEVENS and Nadia followed their guide along a corridor, through several doors, and into a large room, which at first glance seemed empty, but in which several of the peculiarly transparent people of the craft were lying about upon cushions. They were undoubtedly human—but what humans! Tall and reedy they were, with enormous barrel chests, topped by heads which, though really large, appeared insignificant because of the prodigious chests and because of the huge, sail-like, flapping ears. Their skins were a strikingly, livid, pale blue, absolutely devoid of hair; and their lidless eyes, without a sign of iris, were chillingly horrible in their stark contrast of enormous, glaring black pupil and ghastly, transparent blue eyeball.

As the two Terrestrials entered the room, the beings struggled to their feet and hurried laboriously away. Soon one of them returned, dressed in an insulating suit, and carrying three sets of head harnesses, connected by multiplex cables to a large box which he placed upon the floor. He handed the headsets to the first officer, who in turn placed two of them at the feet of the Terrestrials, indicating to them that they were to follow his example in placing them upon their heads, outside the helmets. They did so, and even through the almost perfect insulation, and in spite of the powerful heaters of their suits, they felt a touch of frightful cold. The stranger turned a dial, and the two wanderers from Earth were instantly in full mental communication with Barkovis, the commander of a space-ship of Titan, the sixth satellite of Saturn!

"Well, I'll be . . . say, what is this, anyway?" Steve exclaimed involuntarily, and Nadia smiled as Barkovis answered with a thought, clearer than any spoken words.

"It is a thought-exchanger. I do not know its fundamental mechanism, since we did not invent it and since I have had little time to study it. The apparatus, practically as you see it here, was discovered but a short time ago, in a small, rocket-propelled space-ship which we found some distance outside of the orbit of Jupiter. Its source of power had been destroyed by the cold of outer space, but re-powering it was, of course, a small matter. The crew of the vessel were all dead. They were, however, of human stock, and of a type adapted for life upon a satellite. I deduce, from your compact structure, your enormous atmospheric pressure, and your, to us, unbelievably high body temperature, that you must be planet-dwellers. I suppose that you are natives of Jupiter?"

"Not quite." Stevens had in a measure recovered from his stunned surprise. "We are from Tellus, the third planet," and he revealed rapidly the events leading up to their present situation, concluding: "The people in the other sphere were, we believe, natives of Jupiter or of one of the satellites. We know nothing of them, since we could not look through their screens. You rescued us from them; do you not know them?"

"No. Our visirays also were stopped by their screens of force—screens entirely foreign to our science. This is the first time that any vessel from our Saturnian system has ever succeeded in reaching the neighborhood of Jupiter. We came in peace, but they attacked us at sight and we were obliged to destroy them. Now we must hurry back to Titan, for two reasons. First, because we are already at the extreme limit of our power range and Jupiter is getting further and further away from Saturn. Second because our mirrors, which we had thought perfect reflectors of all frequencies possible of generation, are not perfect. Enough of those forces came through the mirrors to volatilize half our crew, and in a few minutes more none of us would have been left alive. Why, in some places our very atmosphere became almost hot enough to melt water! If another of those vessels should attack us, in all probability we should all be lost. Therefore we are leaving as rapidly as is possible."

"You are taking the pieces of our ship along—we do not want to encumber you."

"It is no encumbrance, since we have ample supplies of power. In fact, we are now employing the highest acceleration we Titanians can endure for any length of time."

Stevens pondered long, forgetting that his thoughts were plain as print to the Titanian commander. Thank Heaven these strangers had sense enough to be friendly—all intelligent races should be friends, for mutual advancement. But it was a mighty long stretch to Saturn and this acceleration wasn't so much. How long would it take to get there? Could they get back? Wouldn't they save time by casting themselves adrift, making the repairs most urgently needed, and going back to Ganymede under their own power? But would they have enough power left in the wreck to get even that far? And how about the big tube? He was interrupted by an insistent thought from Barkovis.

"You will save time, Stevens, by coming with us to Titan. There we shall aid you in repairing your vessel and in completing your transmitting tube, in which we shall be deeply interested. Our power plants shall supply you with energy for your return journey until you

are close enough to Jupiter to recover your own beam. You are tired. I would suggest that you rest—that you sleep long and peacefully."

"You seem to be handling the *Forlorn Hope* without any trouble—the pieces aren't grinding at all. We'd better live there, hadn't we?"

"Yes that would be best, for all of us. You could not live a minute here without your suits; and, efficiently insulated as those suits are, yet your incandescent body temperature makes our rooms unbearably hot—so hot that any of us must wear a space-suit while in the same room with you, to avoid being burned to death."

"The incandescently hot" Terrestrials were wafted into the open airlock of their lifeboat upon a wand of force, and soon had prepared a long overdue supper, over which Stevens cast his infectious, boyish grin at Nadia.

"Sweetheart, you are undoubtedly a 'warm number,' and you have often remarked that I 'burn you up.' Nevertheless I think that we were both considerably surprised to discover that we are both hot enough actually to consume persons unfortunate enough to be confined in the same room with us!"

"You're funny, Steve—like a crutch," she rebuked him, but smiled back, an elusive dimple playing in one lovely brown cheek. "Looking right through anybody is too ghastly for words, but I think they're perfectly all x, anyway, in spite of their being so hideous and so cold-blooded!"

CHAPTER VI

A Frigid Civilization

"**H**I, Percival Van Schravendyck Stevens!" Nadia strode purposely into Stevens' room and seized him by the shoulder. "Are you going to sleep all the way to Saturn? You answered me when I pounded on the partition with a hammer, but I don't believe that you woke up at all. Get up, you—breakfast will be all spoiled directly!"

"Huh?" Stevens opened one sluggish eye; then, as the full force of the insult penetrated his consciousness, he came wide awake. "Lay off those names, ace, or you'll find yourself walking back home!" he threatened.

"All x by me!" she retorted. "I might as well go home if you're going to sleep *all* the time!" and she widened her expressive eyes at him impishly as she danced blithely back into the control room. As she went out she slammed his door with a resounding clang, and Stevens pried himself out of his bunk one joint at a time, dressed, and made himself presentable.

"Gosh!" he yawned mightily as he joined the girl at breakfast. "I don't know when I've had such a gorgeous sleep. How do you get by on so little?"

"I don't. I sleep a lot, but I do it every night, instead of working for four days and nights on end and then trying to make up all those four nights' sleep at once. I'm going to break you of that, too, Steve, if it's the last thing I ever do."

"There might be certain advantages in it, at that," he conceded, "but sometimes you've got to do work when it's got to be done, instead of just between sleeps. However, I'll try to do better. Certainly it is a wonderful relief to get out of that mess, isn't it?"

"I'll say it is! But I wish that those folks were more like people. They're nice, I think, really, but they're so . . . so . . . well, so ghastly that it simply gives me the blue shivers just to look at one of them!"

"They're pretty gruesome, no fooling," he agreed, "but you get used to things like that. I just about threw a fit the first time I ever saw a Martian, and the Venerians are even worse in some ways—they're so clammy and dead-looking—but now I've got real friends on both planets. One thing, though, gives me the pip. I read a story a while ago—the latest best-seller thing of Thornton's name 'Interstellar Slush' or some such tr. . ."

"Cleopatra—An Interstellar Romance," she corrected him. "I thought it was wonderful!"

"I didn't. It's fundamentally unsound. Look at our nearest neighbors, who probably came from the same original stock we did. A Tellurian can admire, respect, or like a Venerian, yes. But for *loving* one of them—wow! Beauty is purely relative, you know. For instance, I think that you are the most perfectly beautiful thing I ever saw; but no Venerian would think so. Far from it. Any Martian that hadn't seen many of us would have to go rest his eyes after taking one good look at you. Considering what love means, it doesn't stand to reason that any Tellurian woman could possibly fall in love with any man not of her own breed. Any writer is wrong who indulges in interplanetary love affairs and mad passions. They simply don't exist. They *can't* exist—they're against all human instincts."

"Inter-planetary—in this solar system—yes. But the Dacrovos were just like us, only nicer."

"That's what gives me the pip. If our own cousins of the same solar system are so repulsive to us, how would we be affected by entirely alien forms of intelligence?"

"May be you're right, of course—but you may be wrong, too," she insisted. "The Universe is big enough, so that people like the Dacrovos may possibly exist in it somewhere. May be the Big Three will discover a means of interstellar travel—then I'll get to see them myself, perhaps."

"Yes, and *if* we do, and *if* you ever see any such people, I'll bet that the sight of them will make your hair curl right up into a ball, too! But about Barkovis—remember how diplomatic the thoughts were that he sent us? He described our structure as being 'compact,' but I got the undertone of his real thoughts, as well. Didn't you?"

"Yes, now that you mention it, I did. He really thought that we were white-hot, under-sized, over-powered, warty, hairy, hideously opaque and generally repulsive little monstrosities—thoroughly unpleasant and distasteful. But he was friendly, just the same. Heavens, Steve! Do you suppose that he read our real thoughts, too?"

"Sure he did; but he is intelligent enough to make allowances, the same as we are doing. He isn't any more insulted than we are. He knows that such feelings are ingrained and cannot be changed."

BREAKFAST over, they experienced a new sensation. For the first time in months they had nothing to do! Used as they were to being surrounded by pressing tasks, they enjoyed their holiday immensely for a few hours. Sitting idly at the communicator plate, they scanned the sparkling heavens with keen interest. Beneath them Jupiter was a brilliant crescent not far

from the sun in appearance, which latter had already grown perceptibly smaller and less bright. Above them and to their right, Saturn shone refulgently, his spectacular rings plainly visible. All about them were the glories of the firmament, which never fail to awe the most seasoned observer. But idleness soon became irksome to those two active spirits, and Stevens prowled restlessly about their narrow quarters.

"I'm going to go to work before I go dippy," he soon declared. "They've got lots of power, and we can rig up a transmitter unit to send it over here to our receptor. Then I can start welding the old *Hope* together without waiting until we get to Titan to start it. Think I'll signal Barkovis to come over, and see what he thinks about it."

The Titanian commander approved the idea, and the transmitting field was quickly installed. Nadia insisted that she, too, needed to work, and that she was altogether too good a mechanic to waste; therefore the two again labored mightily together, day after day. But the girl limited rigidly their hours of work to those of the working day; and evening after evening Barkovis visited with them for hours. Dressed in his heavy space-suit and supported by a tractor beam well out of range of what seemed to him terrific heat radiated by the bodies of the Terrestrials, he floated along unconcerned; while over the multiplex cable of the thought-exchanger he conversed with the man and woman seated just inside the open outer door of their air-lock. The Titanian's appetite for information was insatiable—particularly did he relish everything pertaining to the earth and to the other inner planets, forever barred to him and to his kind. In return Stevens and Nadia came gradually to know the story of the humanity of Titan.

"I am glad beyond measure to have known you," Barkovis mused one night. "Your existence proves that there is truth in mythology, as some of us have always believed. Your visit to Titan will create a furor in scientific circles, for you are impossibility incarnate—personifications of the preposterous. In you, wildest fancy had become commonplace. According to many of our scientists, it is utterly impossible for you to exist. Yet you say, and it must be, that there are millions upon millions of similar beings. Think of it! Venerians, Tellurians, Martians, the satellite dwellers of the lost space-ship, and us—so similar mentally, yet physically how different!"

"But where does the mythology come in?" thought Nadia.

"We have unthinkable ancient legends which say that once Titan was extremely hot, and that our remote ancestors were beings of fire, in whose veins ran molten water instead of blood. Since our recorded history goes back some tens of thousands of Saturnian years, and since in that long period there has been no measurable change in us, few of us have believed in the legends at all. They have been thought the surviving figments of a barbarous, prehistoric worship of the sun. However, such a condition is not in conflict with the known facts of cosmogony, and since there actually exists such a humanity as yours—a humanity whose bodily tissues actually are composed largely of molten water—those ancient legends must indeed have been based upon truth.

"What an evolution! Century after century of slowly decreasing temperature—one continuous struggle to

adapt the physique to a constantly changing environment. First they must have tried to maintain their high temperature by covering and heating their cities. Then, as vegetation died, they must have bred into their plants the ability to use as sap purely chemical liquids, such as our present natural fluids—which also may have been partly synthetic then—instead of the molten water to which they had been accustomed. They must have modified similarly the outer atmosphere; must have made it more reactive, to compensate for the lowered temperature at which metabolism must take place. As Titan grew colder and colder they probably dug their cities deeper and ever deeper; until humanity came finally to realize that it must itself change completely or perish utterly.

"Then we may picture them as aiding evolution in changing their body chemistry. For thousands and thousands of years there must have gone on the gradual adaptation of blood stream and tissue to more and more volatile liquids, and to lower and still lower temperatures. This must have continued until Titan arrived at the condition which has now obtained for ages—a condition of thermal equilibrium with space upon one hand and upon the other the sun, which changes appreciably only in millions upon millions of years. In equilibrium at last—with our bodily and atmospheric temperatures finally constant at their present values, which seem as low to you as yours appear high to us. Truly, an evolution astounding to contemplate!"

"But how about power?" asked Stevens. "You seem to have all you want, and yet it doesn't stand to reason that there could be very much generated upon a satellite so old and so cold."

"You are right. For ages there has been but little power produced upon Titan. Many cycles ago, however, our scientists had developed rocket-driven space-ships, with which they explored our neighboring satellites, and even Saturn itself. It is from power plants upon Saturn that we draw energy. Their construction was difficult in the extreme, since the pioneers had to work in braces because of the enormous force of gravity. Then, too, they had to be protected from the overwhelming pressure and poisonous qualities of the air, and insulated from a temperature far above the melting point of water. In such awful heat, of course, our customary building material, water, could not be employed. . . ."

"But all our instruments have indicated that Saturn is cold!" Stevens interrupted.

"Its surface temperature, as read from afar, would be low," conceded Barkovis, "but the actual surface of the planet is extremely hot, and is highly volcanic. Practically none of its heat is radiated because of the great density and depth of its atmosphere, which extends for many hundreds of your kilometers. It required many thousands of lives and many years of time to build and install those automatic power plants, but once they were in operation, we were assured of power for many tens of thousands of years to come."

"Our system of power transmission is more or less like yours, but we haven't anything like your range. Suppose you'd be willing to teach me the computation of your fields?"

"Yes, we shall be glad to give you the formulae. Being an older race, it is perhaps natural that we should have developed certain refinements as yet unknown to you. But I am, I perceived, detaining you from your

time of rest—goodbye,” and Barkovis was wafted back toward his mirrored globe.

“What do you make of this chemical solution blood of theirs, Steve?” asked Nadia, watching the placidly floating form of the Titanian captain.

“Not much. I may have mentioned before that there are one or two, or perhaps even three men who are better chemists than I am. I gathered that it is something like a polyhydric alcohol and something like a substituted hydrocarbon, and yet different from either in that it contains flourin in loose combination. I think it is something that our Tellurian chemists haven’t got yet; but they’ve got so many organic compounds now that they may have synthesized it, at that. You see, Titan’s atmosphere isn’t nearly as dense as ours, but what there is of it is pure dynamite. Ours is a little oxygen, mixed with a lot of inert ingredients. Theirs is oxygen, heavily laced with flourin. It’s *reactive*, no fooling! However, something pretty violent must be necessary to carry on body reactions at such a temperature as theirs.”

“Probably; but I know even less about that kind of thing than you do. Funny, isn’t it, the way he thinks ‘water’ when he means ice, and always thinks of our real water as being molten?”

“Reasonable enough when you think about it. Temperature differences are logarithmic, you know, not arithmetic—the effective difference between his body temperature and ours is perhaps even greater than that between ours and that of melted iron. We never think of iron as being a liquid, you know.”

“That’s right, too. Well, good night, Steve dear.”

“Bye, little queen of space—see you at breakfast,” and the *Forlorn Hope* became dark and silent.

DAY after day the brilliant sphere flew toward distant Saturn, with the wreckage of the *Forlorn Hope* in tow. Piece by piece that wreckage was brought together and held in place by the Titanian tractors; and slowly but steadily, under Stevens’ terrific welding projector, the stubborn steel flowed together, once more to become a seamless, spaceworthy structure. And Nadia, the electrician, followed close behind the welder. Wielding torch, pliers and spanner with practised hand, she repaired or cut out of circuit the damaged accumulator cells and reunited the ends of each severed power lead. Understanding Nadia’s work thoroughly, the Titanians were not particularly interested in it; but whenever Stevens made his way along an outside seam, he had a large and thrillingly horrified gallery. Everyone who could possibly secure permission to leave the sphere did so, each upon his own pencil of force, and went over to watch the welder. They did not come close to him—to venture within fifty feet of that slow moving spot of scintillating brilliance, even in a space-suit, meant death—but, poised around him in space, they watched with shuddering, incredulous amazement, the monstrous human being in whose veins ran molten water instead of blood; whose body was already so fiercely hot that it could exist unharmed while working practically without protection, upon *liquefied metal*!

Finally the welding was done. The insulating space was evacuated and held its vacuum—outer and inner shells were bottle-tight. The two mechanics heaved deep sighs of relief as they discarded their cumbersome armor and began to repair what few of their machine

tools had been damaged by the slashing plane of force which had so neatly sliced the *Forlorn Hope* into sections.

“Say, big fellow, you’re the guy that slings the ink, ain’t you?” Nadia extinguished her torch and swaggared up to Stevens, hands on hips, her walk an exaggerated roll. “Write me out a long walk. This job’s all played out, so I think I’ll get me a good job on Titan. I said give me my time, you big stiff!”

“You didn’t say nothing!” growled Stevens in his deepest bass, playing up to her lead as he always did. “Bounce back, cub, you’ve struck a rubber fence! You signed on for duration and you’ll stick—see?”

Arm in arm they went over to the nearest communicator plate. Flipping the switch, Stevens turned the dial and Titan shone upon the screen; so close, that it no longer resembled a moon, but was a world toward which they were falling with an immense velocity.

“Not close enough to make out much detail yet—let’s take another look at Saturn,” and Stevens projected the visiray beam out toward the mighty planet. It was now an enormous full moon, almost five degrees in apparent diameter,* its visible surface an expanse of what they knew to be billowing cloud, shining brilliantly white in the pale sunlight, broken only by a dark equatorial band.

“Those rings were *such* a gorgeous spectacle a little while ago!” Nadia mourned. “It’s a shame that Titan has to be right in their plane, isn’t it? Think of living this close to one of the most wonderful sights in the Solar System, and never being able to see it. Think they know what they’re missing, Steve?”

“We’ll have to ask Barkovis,” Stevens replied. He swung the communicator beam back toward Titan, and Nadia shuddered.

“Oh, it’s hideous!” she exclaimed. “I thought that it would improve as we got closer, but the plainer we can see it, the worse it gets. Just to think of human beings, even such cold-blooded ones as those over there, living upon such a horrible moon and *liking* it, gives me the blue shivers!”

“It’s pretty bleak, no fooling,” he admitted, and peered through the eyepiece of the visiray telescope, studying minutely the forbidding surface of the satellite they were so rapidly approaching.

Larger and larger it loomed, a cratered, jagged globe of desolation indescribable; of sheer, bitter cold incarnate and palpable; of stark, sharp contrasts. Gigantic craters, in whose yawning depths no spark of warmth had been generated for countless cycles of time, were surrounded by vast plains eroded to the dead level of a windless sea. Every lofty object cast a sharply outlined shade of impenetrable blackness, beside which the weak light of the sun became a dazzling glare. The ground was either a brilliant white or an intense black, unrelieved by half-tones.

“I can’t hand it much, either, Nadia, but it’s all in the way you’ve been brought up, you know. This is home to them, and just to look at Telus would give them the pip. Ha! Here’s something you’ll like, even if it does look so cold that it makes me feel like hugging a couple of heater coils. It’s Barkovis’ city the one we’re heading for, I think. It’s close enough now so that we can get it on the plate,” and he set the communicator beam upon the metropolis of Titan.

*The moon subtends an angle of about one-half of a degree.

"Why, I don't see a thing, Steve—where and what is it?" They were dropping vertically downward toward the center of a vast plain of white, featureless and desolate; and Nadia stared in disappointment.

"You'll see directly—it's too good to spoil by telling you what to look for or wh. . ."

"Oh, there it is!" she cried. "It is beautiful, Steve, but how frightfully, utterly cold!"

A FLASH of prismatic color had caught the girl's eye, and, one transparent structure thus revealed to her sight, there had burst into view a city of crystal. Low buildings of hexagonal shape, arranged in irregularly variant hexagonal patterns, extended mile upon mile. From the roofs of the structures lacy spires soared heavenward; inter-connected by long, slim cantilever bridges whose prodigious spans seemed out of all proportion to the gossamer delicacy of their construction. Buildings, spires, and bridges formed fantastic geometrical designs, at which Nadia exclaimed in delight.

"I've just thought of what that reminds me of—it's snowflakes!"

"Sure—I knew it was something familiar. Snowflakes—no two are ever exactly alike, and yet every one is symmetrical and hexagonal. We're going to land on the public square—see the crowds? Let's put on our suits and go out."

The *Forlorn Hope* lay in a hexagonal park, and near it the Titanian globe had also come to rest. All about the little plot towered the glittering buildings of crystal, and in its center played a fountain; a series of clear and sparkling cascades of liquid jewels. Under foot there spread a thick, soft carpet of whitely brilliant vegetation. Throngs of the grotesque citizens of Titania were massed to greet the space-ships; throngs clustering close about the globular vessel, but maintaining a respectful distance from the fiercely radiant Terrestrial wedge. All were shouting greetings and congratulations—shouts which Stevens found as intelligible as his own native tongue.

"Why, I can understand every word they say, Steve!" Nadia exclaimed, in surprise. "How come, do you suppose?"

"I can, too. Don't know—must be from using that thought telephone of theirs so much, I guess. Here comes Barkovis—I'll ask him."

The Titanian commander had been in earnest conversation with a group of fellow-creatures and was now walking toward the Terrestrials, carrying the multiple head-sets. Placing them upon the white sward, he backed away, motioning the two visitors to pick them up.

"It may not be necessary, Barkovis," Stevens said, slowly and clearly. "We do not know why, but we can understand what your people are saying, and it may be that you can now understand us."

"Oh, yes, I can understand your English perfectly. A surprising development, but perhaps, after all, one that should have been expected, from the very nature of the device we have been using. I wanted to tell you that I have just received grave news, which makes it impossible for us to help you immediately, as I promised. While we were gone, one of our two power-plants upon Saturn failed. In consequence, Titan's power has been cut to a minimum, since maintaining our beam at that great distance required a large fraction of the output of the other plant. Because of this lack, the Sedlor walls were weakened to such a point that in spite of the Guardian's

assurances, I think trouble is inevitable. At all events, it is of the utmost importance that we begin repairing the damaged unit, for that is to be a task indeed."

"Yes, it will take time," agreed Stevens, remembering what the Titanian captain had told him concerning the construction of those plants—generators which had been in continuous and automatic operation for thousands of Saturnian years.

"It will take more than time—it will take lives," replied Barkovis, gravely. "Scores, perhaps hundreds, of us will never again breathe the clear, pure air of Titan. In spite of all precaution and all possible bracing and insulation, man after man after man will be crushed by his own weight, volatilized by the awful heat, poisoned by the foul atmosphere, or will burst into unthinkable flames at the touch of some flying spark from the inconceivably hot metals with which we shall have to work. A horrible fate, but we shall not lack for volunteers."

"Sure not; and of course you yourself would go. And I never thought of the effect a spark would have on you—your tissues would probably be wildly inflammable. But say, I just had a thought. Just how hot is the air at those plants and just what is the actual pressure?"

"According to the records, the temperature is some forty of your centigrade degrees above the melting-point of water, and the pressure is not far short of two of your meters of mercury. I find it almost impossible to think of mercury as a liquid, however."

"You find it impossible, since you use it as a metal, for wires in coils and so on. But plus forty, while pretty warm, isn't impossible, by any means; and we could stand double our air pressure for quite a while. Both my partner and I are pretty fair mechanics and we've got quite a line of machine tools, such as you could not possibly have here. We'll give it a whirl, since we owe you something already. Lead us to it, ace—but wait a minute! We can't see through the fog, so couldn't find the plants, and probably your wiring diagrams would explode if I touched them."

"I never thought of your helping us," mused Barkovis. "The idea of any living being existing in that inferno has always been unthinkable, but the difficulties you mention are slight. We have already built in our vessel communicators similar to yours, and radio sets. With these we can guide you and explain the plants to you as you work, and our tractor beams will be of assistance to you in moving heavy objects, even at such distances from the surface as we Titanians shall have to maintain. If you will set out a flask of your atmosphere, we will analyze it, for the thought has come to me that perhaps, being planet-dwellers yourselves, the air of Saturn might not be as poisonous to you as it is to us."

"That's a thought, too," and, the news broadcast, it was not long until the two ships leaped into the air, to the accompaniment of the cheers and plaudits of a watching multitude.

IN a wide curve they sped toward Saturn. Passing so close to the enormous rings that the individual meteoric fragments could almost be seen with the unaided eye, they flashed on and on, slowing down long before they approached the upper surface of the envelope of cloud. The spherical space-ship stopped and Stevens, staring into his useless screen, drove the *Forlorn Hope* downward mile after mile, solely under Barkovis' direction, changing course and power from time to time as

the Titanian's voice came from the speaker at his elbow. Slower and slower became the descent, until finally, almost upon the broad, flat roof of the power-plant, Stevens saw it in his plate. Breathing deeply in relief, he dropped quickly down upon a flat pavement, neutralized his controls, and turned to Nadia.

"Well, old golf-shootist, we're here at last—now we'll go out and see what's gone screwy with the works. Remember that gravity is about double normal here, and conduct yourself accordingly."

"But it's supposed to be only about nine-tenths," she objected.

"That's at the outer surface of the atmosphere," he replied. "And it's *some* atmosphere—not like the thin layer we've got on Tellus."

They went into the airlock, and Stevens admitted air until their suits began to collapse. Then, face-plate valves cracked, he sniffed cautiously, finally opening his helmet vice. Nadia followed suit and the man laughed as she wrinkled her nose in disgust as two faint, but unmistakable odors smote her olfactory nerves.

"I never cared particularly for hydrogen sulphide and sulphur dioxide, either," he assured her, "but they aren't strong enough to hurt us in the short time we'll be here. Those Titanian chemists know their stuff, though."

He opened the outer valves slowly, then opened the door and they stepped down upon the smooth, solid floor, which Stevens examined carefully.

"I thought so, from his story. Solid platinum! This whole planet is built of platinum, iridium, and noble alloys—the only substances known that will literally last forever. Believe me, ace of my bosom, I don't wonder that it cost them lives to build it—with their conditions, I don't see how they ever got it built at all."

Before them rose an immense, flat-topped cone of metal, upon the top of which was situated the power plant. Twelve massive pillars supported a flat roof, but permitted the air to circulate freely throughout the one great room which housed the machinery. They climbed a flight of stairs, passed between two pillars, and stared about them. There was no noise, no motion—there was nothing that *could* move. Twelve enormous masses of metallic checkerwork, covered with wide cooling fins, almost filled the vast hall. From the center of each mass great leads extended out into a clear space in the middle of the room, there uniting in mid-air to form one enormous bus-bar. This bar, thicker than a man's body, had originally curved upward to the base of an immense parabolic structure of latticed bars. Now, however, it was broken in midspan and the two ends bent toward the floor. Above their heads, a gagged hole gaped in the heavy metal of the roof, and a similar hole had been torn in the floor. The bar had been broken and these holes had been made by some heavy body, probably a meteorite, falling with terrific velocity.

"This is it, all right," Stevens spoke to distant Barkovis. "Sure there's nothing on this beam? If it should be hot and I should short circuit or bridge it with my body, it would be just too bad."

"We have made sure that nothing is connected to it," the Titanian assured him. "Do you think you can do anything?"

"Absolutely. We've got jacks that'll bend heavier stuff than that, and after we get it straightened the welding will be easy, but I'll have to have some metal. Shall I cut a piece off the pavement outside?"

"That will not be necessary. You will find ample stores of space metal piled at the base of each pillar."

"All x. Now we'll get the jack, Nadia," and they went back to their vessel, finding that upon Saturn, their combined strength was barely sufficient to drag the heavy tool along the floor.

"Stand aside, please. We will place it for you," a calm voice sounded in their ears, and a pale blue tractor beam picked the massive jack lightly from the floor, and as lightly lifted it to its place beneath the broken bus-bar and held it there while Stevens piled blocks and plates of platinum beneath its base.

"Well, here's where I peel down as far as the law allows. This is going to be real work, girl—no fooling. It'd help a lot if this outfit were sending out a few thousand kilo-franks instead of standing idle."

"How would that help?"

"It's a heat-engine, you know—works by absorbing heat. The cold air sinks—I imagine it pretty nearly blows a gale down the side of this cone when it's working—and hot air rushes in to take its place. I could use a little cold breeze right now," and Stevens, stripped to the waist, bent to the lever of the powerful hydraulic jack.

Beads of sweat gathered upon his broad back, uniting to form tiny rivulets, and the girl became highly concerned about him.

"Let me help you, Steve—I'm pretty husky, too, you know."

"Sure you are, ace, but this is a job for a truck-horse, not a tenderly-nurtured maiden of the upper classes. You can help, though, by breaking out that welding outfit and getting it ready while I'm doing this bending to prepare for the welding."

Under the urge of that mighty jack the ends of the broken bus-bar rose into place, while far off in space the Titanians clustered about their visiray screens, watching, in almost unbelieving amazement, the supernatural being who labored in that reeking inferno of heat and poisonous vapor—who labored almost naked and entirely unprotected, refreshing himself from time to time with drafts of molten water!

"All x, Barkovis—that's high, I guess," Stevens flipped perspiration from his hot forehead with a wet finger and straightened his weary back. "Now you can put this jack away where we had it. Then you might trundle me over enough of that spare metal to fill up this hole, and I'll put on my suit and goggles and practice welding on this floor and the roof, to get the feel of the metal before I tackle the bar."

The hole in the floor was filled with scrap and soon sparks were flying wildly as the searing beam of Stevens' welding projector bit viciously into the stubborn alloy of noble metals; fashioning a smooth, solid floor where the yawning aperture had been. Then, lifted with his tools and plates to the roof, the man repaired that hole also.

"Now I know enough about it to do a good job on the bar," he decided, and brick after brick of alloy was fused into the crack, until only a smoothly rounded bulge betrayed that a break had ever existed in that mighty rod of metal.

"Give 'em the signal to draw power, and see if that's all that was the matter," Stevens instructed, as he relaxed in the grateful coolness of their control room. "Whew, that was a warm job, Nadia—and this air of ours does smell good!"

"It was a horrible job, and I'm glad it's done," she declared. But say, Steve, that thing looks as little like a power-plant as anything I can imagine. How does it work? You said that it worked on heat, but I don't quite see how. But don't draw diagrams and *please* don't integrate!"

"No ordinary plant such as we use could run for centuries without attention," he replied. "This is a highly advanced heat-engine—something like a thermo-couple, you know. This whole thing is simply the hot end, connected to the cold end on Titan by a beam instead of wires. When it's working, this metal must cool off something fierce. That's what the checker-work and fins are for—so that it can absorb the maximum amount of heat from the current of hot, moist air I spoke about. It's a sweet system—we'll have to rig up one between Tellus and the moon. Or even between the Equator and the Arctic Circle there'd be enough thermal differential to give us a million kilofranks. We haven't got the all x signal yet, but it's working—look at it sweat as it cools down!"

"I'll say it's sweating—the water is simply streaming off it!" In their plate they saw that moisture was already beginning to condense upon the heat-absorber: moisture running down the fins in streams and creeping over the dull metal floor in sluggish sheets; moisture which, turning into ice in the colder interior of the checkerwork, again became fluid at the inrush of hot, wet Saturnian air.

"There's the signal—all x, Barkovis? By the way it's condensing water, it seems to be functioning again."

"Perfect!" came the Titanian's enthusiastic reply, "You two planet-dwellers have done more in three short hours than the entire force of Titan could have accomplished in months. You have earned, and shall receive, the highest. . . ."

"As you were, ace!" Stevens interrupted, embarrassed. "This job was just like shooting fish down a well, for us. Since you saved our lives, we owe you a lot yet. We're coming out—straight up!"

The *Forlorn Hope* shot upward, through mile after mile of steaming fog, until at last she broke through into the light, clear outer atmosphere. Stevens located the Titanian space-ship, and the two vessels once more hurtling together through the ether toward Titan, he turned to his companion.

"Take the controls, will you, Nadia? Think I'll finish up the tube. I brought along a piece of platinum from the power plant, and something that I think is tantalum from Barkovis' description of it. With those and the fractions we melted out, I think I can make everything we'll need."

Now that he had comparatively pure metal with which to work, drawing the leads and filaments was relatively a simple task. Working over the hot-bench with torch and welding projector, he made short work of running the leads through the almost plastic glass of the great tube and of sealing them in place. The plates and grids presented more serious problems; but they were solved and, long before Titan was reached, the tube was out in space, supported by a Titanian tractor beam between the two vessels. Stevens came into the shop, holding a modified McLeod gauge which he had just taken from the interior of the tube. When it had come to equilibrium, he read it carefully and yelled.

"Eureka, little fellow! She's down to where I can't

read it, even on this big gauge—so hard that it won't need flashing—harder than any vacuum I ever got on Tellus, even with a Rodebush-Michalek super-pump!"

"But how about occluded and absorbed gas in the filaments and so on when they heat up?" demanded Nadia, practically.

"All gone, ace. I out-gassed 'em plenty out there—seven times, almost to fusion. There isn't enough gas left in the whole thing to make a deep breath for a microbe."

He took up his welding projector and a beam carried him back to the tube. There, in the practically absolute vacuum of space, the last openings in the glass were sealed, and man and great transmitting tube were wafted lightly back into the Terrestrial cruiser.

Hour after hour mirrored Titanian sphere and crude-fashioned terrestrial wedge bored serenely on through space, and it was not until Titan loomed large beneath them that the calm was broken by an insistent call from Titan to the sphere.

"Barkodar, attention! Barkodar, attention!" screamed from the speakers, and they heard Barkovis acknowledge the call.

"The Sedlor have broken through and are marching upon Titania. The order has gone out for immediate mobilization of every unit."

"There's that word 'Sedlor' again—what are they, anyway, Steve?" demanded Nadia.

"I don't know. I was going to ask him when he sprung it on us first, but he was pretty busy then and I haven't thought of it since. Something pretty serious, though—they've jumped their acceleration almost to Tellurian gravity, and none of them can live through much of that."

"Tellurians?" came the voice of Barkovis from the speaker. "We have just. . . ."

"All x—we were on your wave and heard it," interrupted Stevens. "We're with you. What are those Sedlor, anyway? Maybe we can help you dope out something."

"Perhaps—but whatever you do, do not use your heat-projector. That would start a conflagration raging over the whole country, and we shall have enough to do without fighting fire. But it may be that you have other weapons, of which we are ignorant, and I can use a little time in explanation before we arrive. The Sedlor are a form of life, something like your. . . ." he paused, searching through his scanty store of Earthly knowledge, then went on, doubtfully, "perhaps some thing like your insects. They developed a sort of intelligence, and because of their fecundity, adapted themselves to their environment as readily as did man; and for ages they threatened man's supremacy upon Titan. They devoured vegetation, crops, animals, and mankind. After a world-wide campaign, however, they were finally exterminated, save in the neighborhood of one great volcanic crater, which they so honeycombed that it is almost impregnable. All around that district we have erected barriers of force, maintained by a corps of men known as 'Guardians of the Sedlor.' These barriers extend so far into the ground and so high into the air that the Sedlor can neither burrow beneath them nor fly over them. They were being advanced as rapidly as possible, and in a few more years the insects would have been destroyed completely—but now they are again at large. They have probably developed an armor or

a natural resistance greater than the Guardians thought possible, so that when the walls were weakened, they came through in their millions, underground and undetected. They are now attacking our nearest city—the one you know, and which you have called Titania.”

“What do you use—those high-explosive bombs?”

“The bombs were developed principally for use against them, but proved worse than useless, for we found that when a Sedlor was blown to pieces, each piece forthwith developed into a new, complete creature. Our most efficient weapons are our heat rays—not yours remember—and poison gas. I must prepare our arms.”

“Would our heat-ray actually set them afire, Steve?” Nadia asked, as the plate went blank.

“I’ll say it would. I’ll show you what heat means to them—showing you will be plainer than any amount of explanation,” and he shot the visiray beam down toward the city of Titania. Into a low-lying building it went, and Nadia saw a Titanian foundry in full operation. Men clad in asbestos armor were charging, tending, and tapping great electric furnaces and crucibles; shrinking back and turning their armored heads away as the hissing, smoking melt crackled into the molds from their long-handled ladles. Nadia studied the foundry for a moment, interested, but unimpressed.

“Of course it’s hot there—foundries always are hot,” she argued.

“Yes, but you haven’t got the idea yet.” Stevens turned again to the controls, following the sphere toward what was evidently a line of battle. “That stuff that they are melting and casting and that is so hot, is not metal, but ice! Remember that the vital fluid of all life here, animal and vegetable, corresponding to our water, is probably more inflammable than gasoline. If they can’t work on ice-water without wearing suits of five-ply asbestos, what would a real heat-ray do to them? I’d be about like our taking a dive into the sun!”

“Ice!” she exclaimed. “Oh of course—but you couldn’t really believe a thing like that without seeing it, could you? Oh, Steve—how utterly horrible!”

THE “Barkodar” had dropped down into a line of sister ships, and had gone into action in midair against a veritable swarm of foes. Winged centipedes they were—centipedes fully six feet long, hurling themselves along the ground and through the air in furious hordes. From the flying globes emanated pale beams of force, at the touch of which the Sedlor disappeared in puffs of vapor. Upon the ground huge tractors and trucks, manned by masked soldiery, mounted mighty reflectors projecting the same lethal beam. From globes and tanks there sounded a drumming roar and small capsules broke in thousands among the foe; emitting a red cloud of gas in which the centipedes shriveled and died. But for each one that was destroyed two came up from holes in the ground and the battle-line fell back toward Titania, back toward a long line of derrick-like structures which were sinking force-rods into the ground in furious haste.

Stevens flashed on his ultra-violet projector and swung it into the thickest ranks of the enemy. In the beam many of the monsters died, but the Terrestrial ray was impotent compared with the weapons of the Titanians, and Stevens, snapping off the beam with a bitter imprecation, shot the visiray out toward the bare, black cone of the extinct volcano and studied it with care.

“Barkovis, I’ve got a thought!” he snapped into the microphone. “Their stronghold is in that mountain, and there’s millions of them in there yet, coming out along their tunnels. They’ve got all the vegetation eaten away for miles, so there’s nothing much left there to spread a fire if I go to work on that hill, and, I’ll probably melt enough water to put out most of the fires I start. Detail me a couple of ships to drop your fire-foam bombs on any little blazes that may spread, and I’ll give them so much to worry about at home, that they’ll forget all about Titania.”

The *Forlorn Hope* darted toward the crater, followed closely by two of the dazzling globes. They circled the mountain until Stevens found a favorable point of attack—a stupendous vertical cliff of mingled rock and crystal, upon the base of which he trained his terrific infra-red projector.

“I’m going to draw a lot of powder,” he warned the Titanians then. “I’m giving this gun everything she’ll take.”

He drove the massive switches in, and as that dull red beam struck the cliff’s base there was made evident the awful effect of a concentrated beam of real and pure heat upon such an utterly frigid world. Vast columns of fire roared aloft, helping Stevens, melting and destroying the very ground as the bodies of the Sedlor in that gigantic ant-heap burst into flames. Clouds of super-heated steam roared upward, condensing into a hot rain which descended in destructive torrents upon the fastnesses of the centipedes. As the raging beam ate deeper and deeper into the base of the cliff, the mountain itself began to disintegrate; block after gigantic block breaking off and crashing down into the flaming, boiling, seething cauldron which was the apex of that ravaging beam.

Hour after hour Stevens drove his intolerable weapon into the great mountain, teeming with Sedlorean life; and hour after hour a group of Titanian spheres stood by, deluging the surrounding plain with a flood of heavy fumes, through which the holocaust could not spread for lack of oxygen. Not until the mountain was gone—not until in its stead there lay a furiously boiling lake, its flaming surface hundreds of feet below the level of the plain—did Stevens open his power circuits and point the deformed prow of the *Forlorn Hope* toward Titania.

CHAPTER VII

The Return to Ganymede

MUST you go back to Ganymede?” Barkovis asked, slowly and thoughtfully. He was sitting upon a crystal bench beside the fountain, talking with Stevens, who, dressed in his bulging space-suit, stood near an airlock of the *Forlorn Hope*. “It seems a shame that you should face again those unknown, monstrous creatures who so inexcusably attacked us both without provocation.”

“I’m not so keen on it myself, but I can’t see any other way out of it,” the Terrestrial replied. “We left a lot of our equipment there, you know; and even if I should build duplicates here, it wouldn’t do us any good. These ten-nineteens are the most powerful transmitting tubes known when we left Tellus, but even their fields, dense as they are, can’t hold an ultra-beam together much farther than about six astronomical units. So you see

we can't possibly reach our friends from here with this tube; and your system of beam transmission won't hold anything together even that far, and won't work on any wave shorter than Roeser's Rays. We may run into some more of those little spheres, though, and I don't like the prospect. I wonder if we couldn't plate a layer of that mirror of yours upon the *Hope* and carry along a few of those bombs? By the way, what is that explosive—or is it something beyond Tellurian chemistry?"

"Its structure should be clear to you, although you probably could not prepare it upon Tellus because of your high temperature. It is nothing but nitrogen—twenty-six atoms of nitrogen combined to form one molecule of what you would call—N-twenty-six?"

"Wow!" Stevens whistled. "Crystalline, pentavalent nitrogen—no wonder it's violent!"

"We could, of course, cover your vessel with the mirror, but I am afraid that it would prove of little value. The plates are so hot that it would soon volatilize."

"Not necessarily," argued Stevens. "We could live in number one life-boat, and shut off the heat everywhere else. The life-boats are insulated from the structure proper, and the inner and outer walls of the structure are insulated from each other. With only the headquarters lifeboat warm, the outer wall could be held pretty close to zero absolute."

"That is true. The bombs, of course, are controlled by radio, and therefore may be attached to the outer wall of your vessel. We shall be glad to do these small things for you."

The heaters of the *Forlorn Hope* were shut off, and as soon as the outer shell had cooled to Titanian temperature, a corps of mechanics set to work. A machine very like a concrete mixer was rolled up beside the steel vessel, and into its capacious maw were dumped boxes and barrels of dry ingredients and many cans of sparkling liquid. The resultant paste was pumped upon the steel plating in a sluggish, viscous stream, which spread out into a thick and uniform coating beneath the flying rollers of the skilled Titanian workmen. As it hardened, the paste smoothed magically into the perfect mirror which covered the space-vessels of the satellite; and a full dozen of the mirror explosive bombs of this strange people were hung in the racks already provided.

"Once again I must caution you concerning those torpedoes," Barkovis warned Stevens. "If you use them all, very well, but do not try to take even one of them into any region where it is very hot, for it will explode and demolish your vessel. If you do, not use them, destroy them before you descend into the hot atmosphere of Ganymede. The mirror will volatilize harmlessly at the temperature of melting mercury, but the torpedoes must be destroyed. Once more, Tellurians, we thank you for what you have done, and wish you well."

"Thanks a lot for your help—we still owe you something," replied Stevens. "If either of your power-plants go sour on you again, or if you need any more built, be sure to let us know—you can come close enough to the inner planets now on your own beam to talk to us on the ultra-communicator. We'll be glad to help you any way we can—and we may call on you for help again. Goodbye, Barkovis—goodbye, all Titania!"

He made his way through the bitterly cold shop into the control-room of their lifeboat, and while he was divesting himself of his heavy suit, Nadia lifted the *Forlorn Hope* into the blue-green sky of Titan, accompanied by an escort of the mirrored globes. Well clear of the

atmosphere of the satellite, the terrestrial cruiser shot forward at normal acceleration, while the Titanian vessels halted and wove a pattern of blue and golden rays in salute to the departing guests.

"Well, Nadia, we're off—on a long trek, too."

"Said Wun Long Hop, the Chinese pee-lo," Nadia agreed. "Sure everything's all x, big boy?"

"To nineteen decimals," he declared. "You couldn't squeeze another frank into our accumulators with a proof-bar, and since they're sending us all the power we want to draw, we won't need to touch our batteries or tap our own beam until we're almost to Jupiter. To cap the climax, what it takes to make big medicine on those spherical friends of ours, we've got. We're not sitting on top of the world, ace—we've perched exactly at the apex of the entire universe!"

"How long is it going to take?"

"Don't know. Haven't figured it yet, but it'll be *beau-coup* days," and the two wanderers from far-distant Earth settled down to the routine of a long and uneventful journey.

They gave Saturn and his spectacular rings a wide berth and sped on, with ever-increasing velocity. Past the outer satellites, on and on, the good ship *Forlorn Hope* flew into the black-and-brilliant depths of interplanetary space. Saturn was an ever-diminishing disk beneath them: above them was Jupiter's thin crescent, growing ever larger and more bright, and the Monarch of the Solar System, remaining almost stationary day after day, increasing steadily in apparent diameter and in brilliance.

ALTHOUGH the voyage from Titan to Ganymede was long, it was not monotonous, for there was much work to be done in the designing and fabrication of the various units which were to comprise the ultra-radio transmitting station. In the various compartments of the *Forlorn Hope* there were sundry small motors, blowers, coils, condensers, force-field generators, and other items which Stevens could use with little or no alteration; but for the most part he had to build everything himself. Thus it was that time passed quickly; so quickly that Jupiter loomed large and the Saturnian beam of power began to attenuate almost before the Terrestrials realized that their journey was drawing to an end.

"Our beam's falling apart fast," Stevens read his meters carefully, then swung his communicator beam toward Jupiter. "We aren't getting quite enough power to hold our acceleration at normal—think I'll cut now, while we're still drawing enough to let the Titanians know we're off their beam. We've got lots of power of our own now; and we're getting pretty close to enemy territory, so they may locate that heavy beam. Have you found Ganymede yet?"

"Yes, it will be on the other side of Jupiter by the time we get there. Shall I detour, or put on a little more negative and wait for it to come around to this side?"

"Better wait, I think. The farther away we stay from Jupiter and the major satellites, the better."

"All x—it's on. Suppose we'd better start standing watches, in case some of them show up?"

"No use," he dissented. "I've been afraid to put out our electro-magnetic detectors, as they could surely trace them in use. Without them, we couldn't spot an enemy ship even if we were looking right at it, except by accident; since they won't be lighted up and it's awfully hard

to see anything out here, anyway. We probably won't know they're within a million kilometers until they put a beam on us. Barkovis says that this mirror will reflect any beam they can use, and I've already got a set of photo-cells in circuit to ring an alarm at the first flash off of our mirror plating. I'd like to get in the first licks myself, but I haven't been able to dope out any way of doing it. So you might as well sleep in your own room, as usual, and I'll camp here right under the panel until we get to Ganymede. There's a couple of little things I just thought of, though, that may help some; and I'm going to do 'em right now."

Putting on his space-suit, he picked up a power drill and went out into the bitter cold of the outer structure. There he attacked the inner wall of their vessel, and the carefully established inter-wall vacuum disappeared in a screaming hiss of air as the tempered point bit through plate after plate.

"What's the idea, Steve?" Nadia asked, when he had re-entered the control room. "Now you'll have all that pumping to do over again."

"Protection for the mirrors," he explained. "You see, they aren't perfect reflectors. There's a little absorption, so that some stuff comes through. Not much, of course; but enough to kill some of those Titanians and almost enough to ruin their ship got through in about ten minutes, and only one enemy was dealing it out. We can stand more than they could, of course, but the mirror itself won't stand much more heat than it was absorbing then. But with air in those spaces instead of vacuum, and with the whole mass of the *Hope*, except this one lifeboat, as cold as it is, I figure that there'll be enough conduction and convection through them to keep the outer wall and the mirror cold—cool enough, at least, to hold the mirror on for an hour. If only one ship tackles us, it won't be bad—but I figure that if there's only one, we're lucky."

STEVENS' fears were only too well grounded, for during the "evening" of the following day, while he was carefully scanning the heavens for some sign of enemy craft, the alarm bell over his head burst into its brazen clamor. Instantly he shot out the detectors and ultra-lights and saw not one, but six of the deadly globes—almost upon them, at point-blank range! One was already playing a beam of force upon the *Forlorn Hope*, and the other five went into action immediately upon feeling the detector impulses and perceiving that the weapon of their sister ship had encountered an unusual resistance in the material of that peculiarly mirrored wedge. As those terrific forces struck her, the terrestrial cruiser became a vast pyrotechnic set piece, a dazzling fountain of coruscant brilliance: for the mirror held. The enemy beams shot back upon themselves and rebounded in all directions, in the same spectacular exhibition of frenzied incandescence which had marked the resistance of the Titanian sphere to a similar attack.

But Stevens was not idle. In the instant of launching his detectors, as fast as he could work the trips, four of the frightful nitrogen bombs of Titan—all that he could handle at once—shot out into space, their rocket-tubes flaring viciously. The enemy detectors of course located the flying torpedoes immediately, but, contemptuous of material projectiles, the spheres made no attempt to dodge, but merely lashed out upon them with their rav-ening rays. So close was the range that they had no time to avoid the radio-directed bombs after discovering

that their beams were useless against the unknown protective covering of those mirrored shells. There were four practically simultaneous detonations—silent, but terrific explosions as the pent-up internal energy of solid pentavalent nitrogen was instantaneously released—and the four insensately murderous spheres disappeared into jagged fragments of wreckage, flying wildly away from the centers of explosion. One great mass of riven and twisted metal was blown directly upon the fifth globe, and Nadia stared in horrified fascination at the silent crash as the entire side of the ship crumpled inward like a shell of cardboard under the awful impact. That vessel was probably out of action, but Stevens was taking no chances. As soon as he had clamped a pale blue tractor rod upon the sixth and last of the enemy fleet, he drove a torpedo through the gaping wall and into the interior of the helpless war-vessel. There he exploded it, and the awful charge, detonated in that confined space, literally tore the globular space-ship to bits.

"We'll show these jaspers what kind of trees make shingles!" he gritted between clenched teeth; and his eyes, hard now as gray iron, fairly emitted sparks as he launched four torpedoes upon the sole remaining globe of the squadron of the void. "I've had a lot of curiosity to know just what kind of unnatural monstrosities can possibly have such fiendish dispositions as they've got—but beasts, men or devils, they'll find they've grabbed something this time they can't let go of," and fierce blasts of energy ripped from the exhausts as he drove his missiles, at their highest possible acceleration, toward the captive sphere so savagely struggling at the extremity of his tractor beam.

But that one remaining vessel was to prove no such easy victim as had its sister ships. Being six to one, and supposedly invincible, the squadron had been overconfident and had attacked carelessly, with only its crippling slicing beams instead of its more deadly weapons of total destruction; and so fierce and hard had been Stevens' counter-attack that five of its numbers had been destroyed before they realized what powerful armament was mounted by that apparently crude, helpless, and innocuous wedge. The sixth, however, was fully warned, and every resource at the command of its hellish crew was now being directed against the *Forlorn Hope*.

Sheets, cones, and gigantic rods of force flashed and crackled. Space was filled with silent, devastating tongues of flame. The *Forlorn Hope* was dragged about erratically as the sphere tried to dodge those hurtling torpedoes; tried to break away from the hawser of energy anchoring her so solidly to her opponent. But the linkage held, and closer and closer Stevens drove the fourfold menace of his frightful dirigible bombs. Pressor beams beat upon them in vain. Hard driven as those pushers were, they could find no footing, but were reflected at many angles by that untouchable mirror and their utmost force scarcely impeded the progress of the rocket-propelled missiles. Comparatively small as the projectiles were, however, they soon felt the effects of the prodigious beams of heat enveloping them, and torpedo after torpedo exploded harmlessly in space as their mirrors warmed up and volatilized. But for each bomb that was lost, Stevens launched another, and each one came closer to its objective than had its predecessor.

Made desperate by the failure of his every beam, the enemy commander thought to use material projectiles

himself—weapons abandoned long since by his race as antiquated and inefficient, but a few of which were still carried by the older types of vessels. One such shell was found and launched—but in the instant of its launching Stevens' foremost bomb struck its mark and exploded. So close were the other three bombs, that they also let go at the shock; and the warlike sphere, hemmed in by four centers of explosions, flew apart—literally pulverized. Its projectile, so barely discharged, did not explode—it was loaded with material which could be detonated only by the warhead upon impact or by a radio signal. It was, however, deflected markedly from its course by the force of the blast, so that instead of striking the *Forlorn Hope* in direct central impact, its head merely touched the apex of the mirror-plated wedge. That touch was enough. There was another appalling concussion, another blinding glare, and the entire front quarter of the terrestrial vessel had gone to join the shattered globes.

Between the point of explosion and the lifeboats there had been many channels of insulation, many bulkheads, many airbreaks, and compartment after compartment of accumulator cells. These had borne the brunt of the explosion, so that the control room was unharmed, and Stevens swung his communicator rapidly through the damaged portions of the vessels.

"How badly are we hurt, Steve—can we make it to Ganymede?"

Nadia was quietly staring over his shoulder into the plate, studying with him the pictures of destruction there portrayed as he flashed the projector from compartment to compartment.

"We're hurt—no fooling—but it might have been a lot worse," he replied, as he completed the survey. "We've lost about all of our accumulators, but we can land on our own beam, and landing power is all we want, I think. You see, we're drifting straight for where Ganymede will be, and we'd better cut out every bit of power we're using, even the heaters, until we get there. This lifeboat will hold heat for quite a while, and I'd rather get pretty cold than meet any more of that gang. I figured eight hours just before they met us, and we were just about drifting then. I think it is safe to say seven hours blind."

"But can't they detect us anyway? They may have sent out a call, you know."

"If we aren't using any power for anything, their electromagnetics are the only things we'll register on, and they're mighty short-range finders. Even if they should get that close to us, they'll probably think we're meteoric, since we'll be dead to their other instruments. Luckily we've got lots of air, so the chemical purifiers can handle it without power. I'll shut off everything and we'll drift it. Couldn't do much of anything, anyway—even our shop out there won't hold air. But we can have light. We've got acetylene emergency lamps, you know, and we don't need to economize on oxygen."

"Perhaps we'd better run in the dark. Remember what you told me about their possible visirays, and that you've got only two bombs left."

"All x; that would be better. If I forget it, remind me to blow up those before we hit the atmosphere of Ganymede, will you?" He opened all the power switches, and, every source of ethereal vibrations cut off, the *Forlorn Hope* drifted slowly on, now appearing forlorn indeed.

SEVEN hours dragged past: seven age-long hours during which the two sat tense, expecting they knew not what, talking only at intervals and in subdued tones. Stevens then snapped on the communicator beam just long enough to take an observation upon Ganymede. Several such brief glimpses were taken; then, after a warning word to his companion, he sent out and exploded the nitrogen bombs. He then threw on the power, and the vessel leaped toward the satellite under full acceleration. Close to the atmosphere it slanted downward in a screaming, fifteen-hundred-mile drive; and soon the mangled wedge dropped down into the little canyon, which for so long had been "home."

"Well, colonel, home again!" Stevens exulted as he neutralized the controls. "There's that falls, our power plant, the catapults, 'n' everything. Now, unless something interrupts us again, we'll run up our radio tower and give Brandon the long yell."

"How much more have you got to do before you can start sending?"

"Not an awful lot. Everything built—all I've got to do is assemble it. I should be able to do it easily in a week. Hope nothing else happens—if I drag you into any more such messes as those we've just been getting out of by the skin of our teeth, I'll begin to wish that we had started out at first to drift it back to Tellus in the *Hope*. Let's see how much time we've got. We should start shooting one day after an eclipse, so that we'll have five days to send. You see, we don't want to point our beam too close to Jupiter or to any of the large satellites, because the enemy might live there and might intercept it. We had an eclipse yesterday—so one week from today, at sunrise, I start shooting."

"But Earth's an evening star now; you can't see it in the morning."

"I'm not going to aim at Tellus. I'm shooting at Brandon, and he's never there for more than a week or two at a stretch. They're prowling around out in space somewhere almost all the time."

"Then how can you possibly hope to hit them?"

"It may be quite a job of hunting, but not as bad as you might think. They probably aren't much, if any, outside the orbit of Mars, and they usually stay within a couple of million kilometers or so of the Ecliptic, so we'll start at the sun and shoot our beam in a spiral to cover that field. We ought to be able to hit them inside of twelve hours, but if we don't, we'll widen our spiral and keep on trying until we do hit them."

"Heavens, Steve! Are you planning on telegraphing steadily for days at a time?"

"Sure, but not by hand, of course—I'll have an automatic sender and automatic pointers."

Stevens had at his command a very complete machine-shop, he had an ample supply of power, and all that remained for him to do was to assemble the parts which he had built during the long journey from Titan to Ganymede. Therefore, at sunrise of the designated day, he was ready, and, with Nadia hanging breathless over his shoulder, he closed the switch, a toothed wheel engaged a delicate interrupter, and a light sounder began its strident chatter.

"Ganymede point oh four seven ganymede point oh four seven ganymede point oh four seven . . ." endlessly the message was poured out into the ether, carried by a tight beam of ultra-vibrations and driven by forces sufficient to propel it well beyond the opposite limits of the orbit of Mars.

"What does it say? I can't read code."

Stevens translated the brief message, but Nadia remained unimpressed.

"But it doesn't say anything!" she protested. "It isn't addressed to anybody, it isn't signed—it doesn't tell anybody anything about anything."

"It's all there, ace. You see, since the beam is moving sidewise very rapidly at that range and we're shooting at a small target, the message has to be very short or they won't get it all while the beam's on 'em—it isn't as though we were broadcasting. It doesn't need any address, because nobody but the *Sirius* can receive it—except possibly the Jovians. They'll know who's sending it without any signature. It tells them that Ganymede wants to receive a message on the ultra-band centering on forty-seven thousandths. Isn't that enough?"

"Maybe. But suppose some of them live right here on Ganymede—you'll be shooting right through the ground all night—or suppose that even if they don't live here, that they can find our beam some way? Or suppose that Brandon hasn't got his machine built yet, or suppose that it isn't turned on when our beam passes them, or suppose they're asleep then? A lot of things might happen."

"Not so many, ace—your first objection is the only one that hasn't got more holes in it than a sieve, so I'll take it first. Since our beam is only a meter in diameter here and doesn't spread much in the first few million kilometers, the chance of direct reception by the enemy, even if they do live here on Ganymede, is infinitesimally small. But I don't believe that they live here—at least, they certainly didn't land on this satellite. As you suggest, however, it is conceivable that they may have detector screens delicate enough to locate our beam at a distance; but since in all probability that means a distance of hundreds of thousands of kilometers, I think it highly improbable. We've got to take the same risk anyway, no matter what we do, whenever we start to use any kind of driving power, so there's no use worrying about it. As for your last two objections, I know Brandon and I know Westfall. Brandon will have receivers built that will take in any wave possible of propagation, and Westfall, the cautious old egg, will have them running twenty-four hours a day, with automatic recorders, finders, and everything else that Brandon can invent—and believe me, sweetheart, that's a lot of stuff!"

"It's wonderful, the way you three men are," replied Nadia thoughtfully, reading between the lines of Stevens' utterance. "They knew that you were on the *Arcturus*, of course—and they knew that if you were alive you'd manage in some way to get in touch with them. And you, away out here after all this time, are superbly confident that they are expecting a call from you. That, I think, is one of the finest things I ever heard of."

"They're two of the world's best—absolutely." Nadia looked at him, surprised, for he had not seen anything complimentary to himself in her remark. "Wait until you meet them. They're men, Nadia—real men. And speaking of meeting them—please try to keep on loving me after you meet Norm Brandon, will you?"

"Don't be a simp!" her brown eyes met his steadily. "You didn't mean that—you didn't even say it, did you?"

"Back it comes, sweetheart! But knowing myself and knowing those two . . ."

"Stop it! If Norman Brandon or Quincy Westfall had been here instead of you, or both of them together,

we'd have been here from now on—we wouldn't even have gotten away from the Jovians!"

"NOW it's your turn to back water, guy!"

"Well, maybe, a little—if both of them were here, they ought to equal you in some things. Brandon says himself that he and Westfall together make one scientist—Dad says he says so."

"You don't want to believe everything you hear. Neither of them will admit that he knows anything or can do anything—that's the way they are."

"Dad has told me a lot about them—how they've always been together ever since their undergraduate days. How they studied together all over the world, even after they'd been given all the degrees loose. How they even went to the other planets to study—to Mars, where they had to live in space-suits all the time, and to Venus, where they had to take ultra-violet treatments every day to keep alive. How they learned everything that everybody else knew and then went out into space to find out things that nobody else ever dreamed of. How you came to join them, and what you three have done since. They're fine, of course—but they aren't *you*," she concluded passionately.

"No, thank Heaven! I know you love me, Nadia, just as I love you—you know I never doubted it. But you'll like them, really. They're a wonderful team. Brandon's a big brute, you know—fully five centimeters taller than I am, and he weighs close to a hundred kilograms—and no lard, either. He's wild, impetuous, always jumping at conclusions and working out theories that seem absolutely ridiculous, but they're usually sound, even though impractical. Westfall's the practical member—he makes Norm pipe down, pins him down to facts, and makes it possible to put his hunches and wild flashes of genius into workable form. Quince is a . . ."

"Now you pipe down! I've heard you rave so much about those two—I'd lots rather rave about you, and with more reason. I wish that sounder would start sounding."

"Our first message hasn't gone half way yet. It takes about forty minutes for the impulse to get to where I think they are, so that even if they got the first one and answered it instantly, it would be eighty minutes before we'd get it. I sort of expect an answer late tonight, but I won't be disappointed if it takes a week to locate them."

"I will!" declared the girl, and indeed, very little work was done that day by either of the castaways.

Slowly the day wore on, and the receiving sounder remained silent. Supper was eaten as the sun dropped low and disappeared, but they felt no desire to sleep. Instead, they went out in front of the steel wall, where Stevens built a small campfire. Leaning back against the wall of their vessel, they fell into companionable silence, which was suddenly broken by Stevens.

"Nadia, I just had a thought. I'll bet four dollars I've wasted a lot of time. They'll certainly have automatic relays on *Tellus*, to save me the trouble of hunting for them, but like an idiot I never thought of it until just this minute, in spite of the speech I made you about them. I'm going to change those directors right now."

"That's quite a job, isn't it?"

"No, only a few minutes."

"Do it in the morning; you've done enough for one day—maybe you've hit them already, any way."

They again became silent, watching Jupiter, an enormous moon some seven degrees in apparent diameter.

"Steve, I simply can't get used to such a prodigious moon! Look at the stripes, and look at that perfectly incredible. . . ."

A gong sounded and they both jumped to their feet and raced madly into the *Hope*. The ultra-receiver had come to life and the sounder was chattering insanely—someone was sending with terrific speed, but with perfect definition and spacing.

"That's Brandon's fist—I'd know his style anywhere," Stevens shouted, as he seized notebook and pencil.

"Tell me what it says, quick, Steve!" Nadia implored.

"Can't talk—read it!" Stevens snapped. His hand was flying over the paper, racing to keep up with the screaming sounder.

"... ymede all x Stevens ganymede all x Stevens ganymede all x placing and will keep sirius on plane between you and tellus circle fifteen forty north going tellus first send full data spreading beam to cover circle fifteen forty quince suggests possibility this message intercepted and translated personally I think such translation impossible and that he is wilder than a hawk but just in case they should be supernaturally intelligent. . . ."

Stevens stopped abruptly and stared at the vociferous sounder.

"Don't stop to listen—keep on writing!" commanded Nadia.

"Can't," replied the puzzled mathematician. "It doesn't make sense. It sounds intelligent—it's made up of real symbols of some kind or other, but they don't mean a thing to me."

"Oh, I see—he's sending mush on purpose. Read the last phrase!"

"Oh, sure—'mush' is right," and with no perceptible break the signals again became intelligible.

"... if they can translate that they are better scholars than we are signing off until hear from you brandon."

THE sounder died abruptly into silence and Nadia sobbed convulsively as she threw herself into Stevens' arms. The long strain over, the terrible uncertainty at last dispelled, they were both incoherent for a minute—Nadia glorifying the exploits of her lover, Stevens crediting the girl herself and his two fellow-scientists with whatever success had been achieved. A measure of self-control regained, Stevens cut off his automatic sender, changed the adjustments of his directors and cut in his manually operated sending key.

"What waves are you using, anyway?" asked Nadia, curiously. "They must be even more penetrating than Roeser's Rays, to have such a range, and Roeser's Rays go right through a planet without even slowing up."

"They're of the same order as Roeser's—that is, they're sub-electronic waves of the fourth order—but they're very much shorter, and hence more penetrating. In fact, they're the shortest waves yet known, so short that Roeser never even suspected their existence."

"Suppose there's a Jovian space-ship out there somewhere that intercepts our beams. Couldn't they locate us from it?"

"Maybe, and maybe not—we'll just have to take a chance on that. That goes right back to what we were talking about this morning. They might be anywhere, so the chance of hitting one is very small. It isn't like hitting the *Sirius*, because we knew within pretty narrow limits where to look for her, and even at that we had to hunt for her for half a day before we hit her. We're

probably safe, but even if they should have located us, we'll probably be able to hide somewhere until the *Sirius* gets here. Well, the quicker I get busy sending the dope, the sooner they can get started."

"Tell them to be sure and bring me all my clothes they can find, a gallon of perfume, a barrel of powder, and a carload of Delray's Fantastic chocolates—I've been a savage so long that I want to wallow in luxury for a while."

"I'll do that—and I want some real cigarettes!"

Stevens first sent a terse, but complete account of everything that had happened to the *Arcturus*, and a brief summary of what he and Nadia had done since the cutting up of the IPV. The narrative finished, he launched into a prolonged and detailed scientific discussion of the enemy and their offensive and defensive weapons. He dwelt precisely and at length upon the functioning of everything he had seen. Though during the long months of their isolation he had been too busy to do any actual work upon the weapons of the supposed Jovians, yet his keen mind had evolved many mathematical and physical deductions, hypotheses, and theories, and these he sent out to the *Sirius*, concluding:

"There's all the dope I can give you. Figure it out, and don't come at all until you can come loaded for bear; they're bad medicine. Call us occasionally, to keep us informed as to when to expect you, but don't call too often. We don't want them locating you, and if they should locate us through your ray or ours, it would be just too bad. So-long. Stevens and Newton."

Nadia had insisted upon staying up and had been brewing pot after pot of her substitutes for coffee while he sat at the key; and it was almost daylight when he finally shut off the power and arose, his right arm practically paralyzed from the unaccustomed strain of hours of telegraphing.

"Well, sweetheart, that's that!" he exclaimed in relief. "Brandon and Westfall are on the job. Nothing to do now but wait, and study up on our own account on those Jovians' rays. This has been one long day for us, though, little ace, and I suggest that we sleep for about a week!"

CHAPTER VIII

Callisto to the Rescue

ALL humanity of Callisto, the fourth major satellite of Jupiter, had for many years been waging a desperate and apparently hopeless defense against invading hordes of six-limbed beings. Every city and town had long since been reduced to level fields of lava by the rays of the invaders. Every building and every trace of human civilization had long since disappeared from the surface of the satellite. Far below the surface lay the city of Zbardk, the largest of the few remaining strongholds of the human race. At one portal of the city a torpedo-shaped, stubby-winged rocket plane rested in the carriage of a catapult. Near it the captain addressed briefly the six men normally composing his crew.

"Men, you already know that our cruise today is not an ordinary patrol. We are to go to One, there to destroy a base of the hexans. We have perhaps one chance in ten thousand of returning. Therefore I am taking only one man—barely enough to operate the plane. Volunteers step one pace forward."

The six stepped forward as one man, and a smile came over the worn face of their leader as he watched them draw lots for the privilege of accompanying him to probable death. The two men entered the body of the torpedo, sealed the openings, and waited.

"Free exits?" snapped the Captain of the Portal, and twelve keen-eyed observers studied minutely screens and instrument panels connected to the powerful automatic lookout stations beneath the rims of the widely separated volcanic craters from which their craft could issue into Callisto's somber night.

"No hexan radiation can be detected from Exit Eight," came the report. The Captain of the Portal raised an arm in warning, threw in the guides, and the two passengers were hurled violently backward, deep into their cushioned seats, as the catapult shot their plane down the runway. As the catapult's force was spent automatic trips upon the undercarriage actuated the propelling rockets and mile after mile, with rapidly mounting velocity, the plane sped through the tube. As the exit was approached, the tunnel described a long vertical curve, so that when the opening into the shaft of the crater was reached and the undercarriage was automatically detached, the vessel was projected almost vertically upward. Such was its velocity and so powerful was the liquid propellant of its rocket motors, that the eye could not follow the flight of the warship as it tore through the thin layer of the atmosphere and hurled itself out into the depths of space.

"Did we get away?" asked the captain, hands upon his controls and eyes upon his moving chart of space.

"I believe so, sir," answered the other officer, at the screens of the six periscopic devices which covered the full sphere of vision. "No reports from the rim, and all screens blank." Once more a vessel had issued from the jealously secret city of Zbardk without betraying its existence to the hated and feared hexans.

For a time the terrific rocket motors continued the deafening roar of their continuous explosions, then, the desired velocity having been attained, they were cut out and for hours the good ship "Bzark" hurtled on through the void at an enormous but constant speed toward the distant world of One, which it was destined never to reach.

"Captain Czuv! Hexan radiation, coordinates twenty two, fourteen, area six!" cried the observer, and the commander swung his own telescopic finder into the indicated region. His hands played over course and distance plotters for a brief minute, and he stared at his results in astonishment.

"I never heard of a hexan traveling that way before," he frowned. "Constant negative acceleration and in a straight line. He must think that we have been cleared out of the ether. Almost parallel to us and not much faster—even at this long range, it is an easy kill unless he starts dodging, as usual."

As he spoke, he snapped a switch and from a port under the starboard wing there shot out into space a small package of concentrated destruction—a rocket-propelled, radio-controlled torpedo. The rockets of the tiny missile were flaming, but that flame was visible only from the rear and no radio beam was upon it. Czuv had given it precisely the direction and acceleration necessary to make it meet the hexan sphere in central impact, provided that sphere maintained its course and acceleration unchanged.

"Shall I direct the torpedo in the case the hexan shifts?" asked the officer.

"I think not. They can, of course, detect any wave at almost any distance, and at the first sign of radio-activity they would locate and destroy the bomb. They also, in all probability, would destroy us. I would not hesitate to attack them on that account alone, but we must remember that we are upon a more important mission than attacking one hexan ship. We are far out of range of their electro-magnetic detectors, and our torpedo will have such a velocity that they will have no time to protect themselves against it after detection. Unless they shift in the next few seconds, they are lost. This is the most perfect shot I ever had at one of them, but one shot is all I dare risk—we must not betray ourselves."

COURSE, lookout, and rank forgotten, the little crew of two stared into the narrow field of vision, set at its maximum magnification. The instruments showed that the enemy vessel was staying upon its original course. Very soon the torpedo came within range of the detectors of the hexans. But as Captain Czuv had foretold, the detection was a fraction of a second too late, rapidly as their screens responded, and the two men of Zbardk uttered together a short, fierce cry of joy as a brilliant flash of light announced the annihilation of the hexan vessel.

"But hold!" The observer stared into his screen. "Upon that same line, but now at constant velocity, there is still a very faint radiation, of a pattern I have never seen before."

"I think . . . I believe. . . ." the captain was studying the pattern, puzzled. "It must be low frequency, low-tension electricity, which is never used, so far as I know. It may be some new engine of destruction, which the hexan was towing at such a distance that the explosion of our torpedo did not destroy it. Since there are no signs of hexan activity and since it will not take much fuel, we shall investigate that radiation."

Tail and port-side rockets burst into roaring activity and soon the plane was cautiously approaching the mass of wreckage, which had been the IPV *Arcturus*.

"Human beings, although of some foreign species!" exclaimed the captain, as his vision-ray swept through the undamaged upper portion of the great liner and came to rest upon Captain King at his desk.

Although the upper ultra-lights of the Terrestrial vessel had been cut away by the hexan plane of force, jury lights had been rigged, and the two commanders were soon trying to communicate with each other. Intelligible conversation was, of course, impossible, but King soon realized that the visitors were not enemies. At their pantomimed suggestion he put on a space-suit and waited himself over to the airlock of the Callistonian warplane. Inside the central compartment, the strangers placed over his helmet a heavily wired harness, and he found himself instantly in full mental communication with the Callistonian commander. For several minutes they stood silent, exchanging thoughts with a rapidity impossible in any language; then, dressed in space-suits, both leaped lightly across the narrow gap into the still open outer lock of the terrestrial liner. King watched Czuv narrowly after the pressure began to collapse his suit, but the stranger made no sign of distress. He had been right in his assurance that the extra pressure would

scarcely inconvenience him. King tore off his helmet, issued a brief order, and soon every speaker in the *Arcturus* announced:

"All passengers and all members of the crew except lookouts on duty will assemble immediately in Saloon Three to discuss a possible immediate rescue."

The subject being one of paramount interest, it was a matter of minutes until the full complement of two hundred men and women were in the main saloon, clinging to hastily rigged hand lines, closely packed before the raised platform upon which were King and Czuv, wired together with the peculiar Callistonian harness. To most of the passengers, familiar with the humanity of three planets, the appearance of the stranger brought no surprise; but many of them stared in undisguised amazement at his childish body, his pale, almost colorless skin, his small, weak legs and arms, and his massive head.

"Ladies and gentlemen!" Captain King opened the meeting. "I introduce to you Captain Czuv, of the scout cruiser *Beavrk*, of the only human race now living upon the fourth large satellite of Jupiter, which satellite we know as Callisto. I am avoiding their own names as much as possible, because they are almost unpronounceable in English or Interplanetary. This device that you see connecting us is a Callistonian thought transformer, by means of which any two intelligent beings can converse without language. Our situation is peculiar, and in order that you may understand fully what lies ahead of us, the captain will now speak to you, through me—that is, what follows will be spoken by Captain Czuv, of the *Beavrk*, but he will be using my vocal organs."

"Friends from distant Tellus," King's voice went on, almost without a break, "I greet you. I am glad, for your sake as well as our own, that your vessel was able to destroy the hexan ship holding you captive, and whose crew would have killed you all as soon as they had landed your vessel and had read your minds. I regret bitterly that we can do so little for you, for only the representatives of a human civilization being exterminated by a race of highly intelligent monsters can fully realize how desirable it is for all the various races of humanity to assist and support each other. In order that you may understand the situation, it is necessary that I delve at some length into ancient history, but we have ample time. In about . . ." he broke off, realizing that the two races had no thought in common in the measure of time.

"One-half time of rotation of Great Planet upon axis" flashed from Czuv's brain, and "About five hours," King's mind flashed back.

"It will be about five hours before any steps can be taken, so that I feel justified in using a brief period for explanation. In the evolution of the various forms of life upon Callisto, two genera developed intelligence far ahead of all others. One genus was the human, as you and I; the other the hexan. This creature, happily unknown to you of the planets nearer our common sun, is the product of an entirely different evolution. It is a six-limbed animal, with a brain equal to our own—one perhaps in some ways superior to our own. They have nothing in common with humanity, however; they have few of our traits and fewer of our mental processes. Even we who have fought them so long can scarcely comprehend the chambers of horror that are their minds. Even were I able to paint a sufficiently vivid picture with words, you of Earth could not begin to understand

their utter ruthlessness and inhumanity, even among themselves. You would believe that I was lying, or that my viewpoint was warped. I can say only that I hope most sincerely that none of you will ever get better acquainted with them.

"AGES ago, then, the human and the hexan developed upon all four of the major satellites of the Great Planet, which you know as Jupiter, and upon the north polar region of Jupiter itself. By what means the two races came into being upon worlds so widely separated in space we know not—we only know it to be the fact. Human life, however, could not long endure upon Jupiter. The various human races, after many attempts to meet conditions of life there by variations in type fell before the hexans; who, although very small in size upon the planet, thrived there amazingly. Upon the three outer satellites humanity triumphed, and many hundreds of cycles ago the hexans of those satellites were wiped out, save for an occasional tribe of savages of low intelligence who lived in various undesirable portions of the three worlds. For ages then there was peace upon Callisto. Here is the picture at that time—upon Jupiter the hexans; upon Io hexans and humans, waging a ceaseless and relentless war of mutual extermination; upon the three outer satellites humanity in undisturbed and unthreatened peace. Five worlds, each ignorant of life upon any other.

"As I have said, the hexans of Jupiter were, and are, diabolically intelligent. Driven probably by their desire to see what lay beyond their atmosphere of eternal cloud, to the penetration of which their eyesight was attuned, they developed the space-ship; and effected a safe landing, first upon the barren, airless moonlet nearest them, and then upon fruitful Io. There they made common cause with the hexans against the humans, and in space of time Ionian humanity ceased to exist. Much traffic and interbreeding followed between the hexans of Jupiter and those of Io, resulting in time in a race intermediate in size between the parent stocks and equally at home in the widely variant air pressures and gravities of planet and satellite. Soon their astronomical instruments revealed the cities of Europa to their gaze, and as soon as they discovered that the civilization of Europa was human, they destroyed it utterly, with the insatiable blood lust that is their heritage.

"In the meantime the human civilizations of Gany-mede and Callisto had also developed instruments of power. Observing the cities upon the other satellites, many scientists studied intensively the problem of space navigation, and finally there was some commerce between the two outer satellites at favorable times. Finally, vessels were also sent to Io and to Europa, but none of them returned. Knowing then what to expect, Gany-mede and Callisto joined forces and prepared for war. But our science, so long attuned to the arts of peace, had fallen behind lamentably in the devising of more and ever more deadly instruments of destruction. Gany-mede fell, and in her fall we read our own doom. Abandoning our cities, we built anew underground. Profiting from lessons learned full bloodily upon Gany-mede, we resolved to prolong the existence of the human race as long as possible.

"The hexans were, and are masters of the physical science. They command the spectrum in a way undreamed of. Their detectors reveal etheric disturbances

at unbelievable distances, and they have at their beck and call forces of staggering magnitude. Therefore in our cities is no electricity save that which is wired, shielded, and grounded; no broadcast radio; no source whatever of etheric disturbances save light—and our walls are fields of force which we believe to be impenetrable to any searching frequency capable of being generated. Now I am able to picture to you the present.

"We are the last representatives of the human race in the Jovian planetary system. Our every trace upon the surface has been obliterated. We are hiding in our holes in the ground, coming out at night by stealth so that our burrows shall not be revealed to the hexans. We are fighting for time in which our scientists may learn the secrets of power—and fearing, each new day, that the enemy may have so perfected their systems of rays that they will be able to detect us and destroy us, even in our underground and heavily shielded retreats, by means of forces even more incomprehensible than those they are now employing.

"Therefore, friends, you see how little we are able to do for you, we a race fighting for our very existence and doomed to extinction save for a miracle. We cannot take you to Callisto, for it is besieged by the hexans and the driving forces of your lifeboats, practically broadcast as they are, would be detected and we should all be destroyed long before we could reach safety. Captain King and I have pondered long and have been able to see only one course of action. We are drifting at constant velocity, using no power, and with all save the most vitally necessary machinery at rest. Thus only may we hope to avoid detection during the next two hours.

"Our present course will take us very close to Europa, which the hexans believe to be, like Ganymede, entirely devoid of civilized life. Its original humanity was totally destroyed, and all its civilized hexans are finding shelter from our torpedoes upon Jupiter until we of Callisto shall likewise have been annihilated. The temperature of Europa will suit you. Its atmosphere, while less dense than that to which you are accustomed, will adequately support your life. If we are not detected in the course of the next few hours we can probably land upon Europa in safety, since its neighborhood is guarded but loosely. In fact, we have a city there, as yet unsuspected by the hexans, in which our scientists will continue to labor after Callisto's civilization shall have disappeared. We think that it will be safe to use your power for the short time necessary to effect a landing. We shall land in a cavern, in a crater already in communication with our city. In that cavern, instructed and aided by some of us, you will build a rocket vessel—no rays can be used because of the hexans—in which you will be able to travel to a region close enough to your earth so that you can call for help. You will not be able to carry enough fuel to land there—in fact, nearly all the journey will have to be made without power, traveling freely in a highly elongated orbit around the sun—but if you escape the hexans, you should be able to reach home safely, in time. It is for the consideration of this plan that this meeting has been called."

"JUST one question," Breckenridge spoke. "The hexans are intelligent. Why are they leaving Europa and Ganymede so unguarded that human beings can move back there and that we can land there, all undetected?"

"I will answer that question myself," replied King. "Captain Czuv did not quite do justice to his own people. It is true that they are being conquered, but for every human life that is taken, a thousand hexans die, and for every human ship that is lost, twenty hexan vessels are annihilated in return. While the hexans are masters of rays, the humans are equally masters of explosives and of mechanisms. They can hit a perfect score upon any target in free space whose course and acceleration can be determined, at any range up to five thousand kilometers, and they have explosives thousands of times as powerful as any known to us. Ray screens are effective only against rays, and the hexans cannot destroy anything they cannot see before it strikes them. So it is that all the hexan vessels except those necessary to protect their own strongholds, are being concentrated against Callisto. They cannot spare vessels to guard uselessly the abandoned satellites. Because of the enormously high gravity of Jupiter the hexans there are safe from human attack save for ineffectual long-range bombardment, but Io is being attacked constantly and it is probable that in a few more years Io also will be an abandoned world. Some of you may have received the impressions that the hexans are to triumph immediately, but such an idea is wrong. The humans can, and will, hold out for a hundred years or more unless the enemy perfects a destructive ray of the type referred to. Even then, I think that our human cousins will hold out a long time. They are able men, fighters all, and their underground cities are beautifully protected."

There was little argument. Most of the auditors could understand that the suggested course was the best one possible. The remainder were so stunned by the unbelievable events of the attack that they had no initiative, but were willing to follow wherever the more valiant spirits led. It was decided that no attempt should be made to salvage any portion of the *Arcturus*, since any such attempt would be fraught with danger and since the wreckage would be of little value. The new vessel was to be rocket driven and was to be built of Callistonian alloys. Personal belongings were moved into lifeboats, doors were closed, and there ensued a painful period of waiting and suspense.

The stated hour was reached without event—no hexan scout had come close enough to them to detect the low-tension radiation of the vital machinery of the *Arcturus*, cut as it was to the irreducible minimum and quite effectively grounded as it was by the enormous mass of her shielding armor. At a signal from Captain Czuv the pilot of each lifeboat shot his tiny craft out into space and took his allotted place in the formation following closely behind the *Bzorek*, flying toward Europa, now so large in the field of vision that she resembled more a world than a moon. Captain King, in the Callistonian vessel, transmitted to Breckenridge the route and flight data given him by the navigator of the winged craft. The chief pilot, flying "point," in turn relayed more detailed instructions to the less experienced pilots of the other lifeboats.

Soon the surface of Europa lay beneath them; a rugged, cratered, and torn topography of mighty ranges of volcanic mountains. Most of the craters were cold and lifeless, but here and there a plume of smoke and steam betrayed the presence of vast, quiescent forces. Straight down one of those gigantic lifeless shafts the fleet of space craft dropped—straight down a full two miles before the landing signal was given. At the bot-

tom of the shaft a section of the rocky wall swung aside, revealing the yawning black mouth of a horizontal tunnel. At intervals upon its roof there winked into being almost invisible points of light. Along that line of lights the lifeboats felt their way, coming finally into a huge cavern, against one sheer metal wall of which they parked in an orderly row. Roll was called, and the terrestrials walked, as well as they could in the feeble gravity of the satellite, across the vast chamber and into a conveyance somewhat resembling a railway coach, which darted away as soon as the doors were shut. For hundreds of miles that strange tunnel extended, and as the car shot along door after door of natural rock opened before it, and closed as soon as it had sped through. In spite of the high velocity of the vehicle, it required almost two hours to complete the journey. Finally, however, it slowed to a halt and the Terrestrial visitors disembarked at a portal of the European city of the Callistionians.

"Attention!" barked Captain King. "The name of this city, as nearly as I can come to it in English, is *WRUZZK*. 'Roosk' comes fairly close to it and is easier to pronounce. We must finish our trip in small cars, holding ten persons each. We shall assemble again in the building in which we have been assigned quarters. The driver of each car will lead his passengers to the council room in which we shall meet."

"Oh, what's the use—this is horrible, horrible—we might as well die!" a nervous woman shrieked, and fainted.

"Such a feeling is, perhaps, natural," King went on, after the woman had been revived and quiet had been restored, "but please control it as much as possible. We are alive and well, and will be able to return to Tellus eventually. Please remember that these people are putting themselves to much trouble and inconvenience to help us, desperate as their own situation is, and conduct yourselves accordingly."

The rebuke had its effect, and with no further protest the company boarded the small cars, which shot through an opening in the wall and into a street of that strange subterranean city. Breckenridge, in the last car to leave the portal, studied his surroundings with interest as his conveyance darted through the gateway. More or less a fatalist by nature and an adventurer, of course, since no other type existed among the older spacehounds of the IPC, he was intensely interested in every new phase of their experience, and was no whit dismayed or frightened.

HE found himself seated in a narrow canoe of metal, immediately behind the pilot, who sat at a small control panel in the bow. Propelled by electromagnetic fields above a single rail, upon lightly touching and noiseless wheels, the terrestrial pilot saw with keen appreciation the manner in which switch after switch ahead of them obeyed the impulses sent ahead from the speeding car. The streets were narrow and filled with monorails; pedestrians pursued their courses upon walks attached to the walls of the buildings, far above the level of the streets. The walls were themselves peculiar, rising as they did stark, unbroken, windowless expanses of metal, merging into and supporting a massive roof of the same silvery metal. Walls and roof alike reflected a soft, yet intense, white light. Soon a sliding switch ahead of them shot in and simultaneously an opening

appeared in the blank metal wall of a building. Through the opening the street-car flew, and as the pilot slowed the canoe to a halt, the door slid smoothly shut behind them. Parking the car beside a row of its fellows, the Callistionian driver indicated that the Terrestrials were to follow him and led the way into a large hall. There the others from the *Arcturus* were assembled, facing Captain King, who was standing upon a table.

"Follow travelers," King addressed them, "our course of action has been decided. There are two hundred three of us. There will be twenty sections of ten persons, each section being in charge of one of the officers of the *Arcturus*. Doctor Penfield, our surgeon, a man whose intelligence, fairness, and integrity are unquestioned, will be in supreme command. His power and authority will be absolute, limited only by the Callistionian Council. He will work in harmony with the engineer, who is to direct the entire project of building the new vessel. Each of you will be expected to do whatever he can—the work you will be asked to do will be well within your powers, and you will each have ample leisure for recreation, study, and amusement, of all of which you will find unsuspected stores in this underground community. You will each be registered and studied by physicians, surgeons, and psychologists; and each of you will have prescribed for him the exact diet that is necessary for his best development. You will find this diet somewhat monotonous, compared to our normal fare of natural products, since it is wholly synthetic; but that is one of the minor drawbacks that must be endured. Chief Pilot Breckenridge and I will not be with you. In some small and partial recompense for what they are doing for us all, he and I are going with Captain Czuv to Callisto, there to see whether or not we can aid them in any way in the fight against the hexans. One last word—Doctor Penfield's rulings will be the products of his own well-ordered mind after consultation and agreement with the Council of this city, and will be for the best good of all. I do not anticipate any refusal to cooperate with him. If, however, such refusal should occur, please remember that he is a despot with absolute power, and that anyone obstructing the program by refusing to follow his suggestions will spend the rest of his time here in confinement and will go back to Tellus in irons, if at all. In case Chief Pilot Breckenridge and I should not see you again, we bid you goodbye and wish you a safe voyage—but we expect to go back with you."

Brief farewells were said and captain and pilot accompanied Czuv to one of the little street-cars. Out of the building it dashed and down the crowded but noiseless thoroughfare to the portal. Signal lights flashed briefly there and they did not stop, but tore on through the portal and the tunnel, with increasing speed.

"Don't have to transfer to a big car, then?" asked Breckenridge.

"No," King made answer. "Small cars can travel these tubes as well as the large ones, and on much less power. In the city the wheels touch the rails lightly, not for support, but to make contacts through which traffic signals are sent and received. In the tunnels the wheels do not touch at all, as signaling is unnecessary—the tunnels being used infrequently and by but one vehicle at a time. No trolleys, tracks, or wires are visible, you notice. Everything is hidden from any possible visiray of the hexans."

"How about their power?"

"I don't understand it very well—hardly at all, in fact."

"It is quite simple." To the surprise of both Terrestrials, Czuv was speaking English, but with a strong and very peculiar accent; slighting all the vowels and accenting heavily the consonant sounds. "The car no longer requires my attention, so I am now free to converse. You are surprised at my knowing your language? You will speak mine after a few more applications of the thought exchanger. I am speaking with a vile accent, of course, but that is merely because my vocal organs are not accustomed to making vowel sounds. Our power is obtained by the combustion of gases in highly efficient turbines. It is transmitted and used as direct current, our generators and motors being so constructed that they can produce no etheric disturbances capable of penetrating the shielding walls of our city. The city was built close to deposits of coal, oil, and gas of sufficient amount to support our life for thousands of years; for from these deposits come power, food, clothing, and all the other necessities and luxuries of our lives. Strong fans draw air from various extinct craters, force it through ventilating ducts into every room and recess of the city, and exhaust it into the shaft of a quiescent volcano, in whose gaseous outflow any trace of our activities is, of course, imperceptible. For obvious reasons no rockets or combustion motors are used in the city proper."

THUS Captain Czuv explained to the Terrestrials his own mode of life, and received from them in turn full information concerning Earthly life, activity, and science. Long they talked, and it was almost time to slow down for the journey's end when the Callistonian brought the conversation back to their immediate concerns.

"My lieutenant and I were upon a mission of some importance, but it is more important to take you to Callisto, for there may be many things in which you can help us. Not in rays—we know all the vibrations you have mentioned and several others. The enemy, however, is supreme in that field, and until our scientists have succeeded in developing ray-screens, such as are used by the hexans, it would be suicidal to use rays at all. Such screens necessitate the projection of pure, yet dirigible, forces—you do not have them upon your planet?"

"No, and so far as I know such screens are also unknown upon Mars and Venus, with whose inhabitants we are friendly."

"The inhabitants of all the planets should be friendly; the solar system should be linked together in intercourse for common advancement. But that is not to be. The hexans will eventually triumph here, and a Jovian system peopled by hexans will have no intercourse with any human civilization save that of internecine war. We, of Callisto, have only one hope—or is it really a hope? In the South Polar country of Jupiter, there dwells a race of beings implacably hostile to the hexans. They seem to invade the country of the hexans frequently, even though they are apparently repulsed each time. Our emissaries to the South Polar country, however, have never returned—those beings, whatever they are, if not actively inimical, certainly are not friendly toward us."

"You know nothing of their nature?"

"Nothing, since our electrical instruments are not sufficiently sensitive to give us more than a general idea of what is transpiring there, and vision is practically useless in that eternal fog. We know, however, that they are far advanced in science, and we are thankful indeed that none of their frightful flying fortresses have been launched against us. They apparently are not interested in the satellites, and it is no doubt due to their unintentional assistance that we have survived as long as we have."

In the cavern at last, the three men boarded the Callistonian space-plane and were shot up the crater's shaft. The voyage to Callisto was uneventful, even uninteresting save at its termination. The *Barvk*, coated every inch as it was with a dull, dead black, completely absorptive outer coating, entered the thin layer of Callisto's atmosphere in darkest night, with all rockets dead, with not a light showing, and with no apparatus of any kind functioning. Utterly invisible and undetectable, she dove downward, and not until she was well below the crater's rim did the forward rockets burst into furious life. Then the Terrestrials understood another reason for the immense depth of those shafts other than that of protection from the detectors of the enemy—all that distance was necessary to overcome the velocity of their free fall without employing a negative acceleration greater than the frail Callistonian bodies could endure. From the cavern at the foot of the shaft, a regulation tunnel extended to the Callistonian city of Zbardk. Portal and city were very like Wruszk, upon distant Europa, and soon the terrestrial captain and pilot were in conference with the Council of Callisto.

MONTHS of Earthly time dragged slowly past, months during which King and Breckenridge studied intensively the offensive and defensive systems of Callisto without finding any particular in which they could improve them to any considerable degree. Captain Czuv and his warplane still survived, and it was while the Callistonian commander was visiting his terrestrial guests, that King voiced the discontent that had long affected both men.

"We're both tired of doing nothing, Czuv. We have been of little real benefit, and we have decided that your ideas of us are all wrong. We are convinced that our personal horsepower can be of vastly more use to you than our brain-power, which doesn't amount to much. Your whole present policy is one of hiding and sniping. I think that I know why, but I want to be sure. Your vessels carry lots of fuel—why can the hexans outrun you?" Thus did King put his problem.

"They can stand enormously higher accelerations than we can. The very strongest of us loses consciousness at an acceleration of twenty-five meters per second per second, no matter how he is braced, and that is only a little greater than the normal gravity of our enemies upon Jupiter. Their vessels at highest power develop an acceleration of thirty-five meters, and the hexans themselves can stand much more than even that high figure," replied Czuv.

"I thought so. Assume that you traveled at forty-five. Would it disable you permanently, or would you recover as soon as it was lowered?"

"We would recover promptly, unless the exposure had been unduly prolonged. Why?"

"Because," said King, "I can stand an acceleration of fifty-four meters for two hours, and Breckenridge here tests fifty two meters. I can navigate anything, and Breckenridge can observe as well as any of your own men. Build a plane to accelerate at forty-five meters and we will blow those hexans out of the ether. You will have to revive and do the shooting, however—your gunnery is entirely beyond us."

"That is an idea of promise, and one that had not occurred to any of us," Czuv replied and work was begun at once upon the new flyer.

When the super-plane was ready for its maiden voyage, its crew of three studied it as it lay in the catapult at the portal. Dead black as were all the warplanes, its body was twice as large as that of the ordinary vessel, its wings were even more stubby, and its accommodations had been cut to a minimum to make room for the enormous stores of fuel necessary to drive the greatly increased battery of rocket motors and for the extra supply of torpedoes carried. Waving to the group of soldiers and citizens gathered to witness the take-off of the new dreadnaught of space, the three men entered the cramped operating compartment, strapped themselves into their seats, and were shot away. As usual the driving rockets were cut off well below the rim of the shaft, and the vessel rose in a long and graceful curve, invisible in the night. Such was its initial velocity and so slight was the force of gravity of the satellite that they were many hundreds of miles from the exit before they began to descend, and Breckenridge studied his screens narrowly for signs of hexan activity.

"Do you want to try one of your long-range shots when we find one of them?" the pilot asked Czuv.

"No, it would be useless. Between deflection by air-currents and the dodging of the enemy vessels, our effective range is shortened to a few kilometers, and their beams are deadly at that distance. No, our best course is to follow the original plan—to lure them out into space at uniform acceleration, where we can destroy them easily."

"Right," and Breckenridge turned to King, who was frowning at his controls. "How does she work on a dead stick, Chief?"

"Maneuverability about minus ten at this speed and in this air. She'd have to have at least fifteen hundred kilometers an hour to be responsive out here. See anything yet?"

"Not yet . . . wait a minute! Yes, there's one now—P-12 on area five. Give us all the X10 and W27 you can, without using power—we want to edge over close enough so that she can't help but see us when we start the rockets."

"Be sure and stay well out of range. I'm giving her all she'll take, but she won't take much. With these wings she has the gliding angle of a kitchen sink."

"All x—I'm watching the range, close. Wish we had instruments like these on the IPV's. We'll have to install some when we get back. All x! Give her the gun—level and dead ahead!"

Half the battery of rockets burst into their stuttering, explosive roar of power and the vessel darted away in headlong flight.

"He sees us and is after us—turn her straight up!"

A searing, coruscating finger of flame leaped toward them, but their calculations had been sound—the hexan

was harmless at that extreme range. King, under the pilot's direction, kept the plane at a safe distance from the sphere while the satellite grew smaller and smaller behind them and Czuv lapsed quietly into unconsciousness.

"He's been out for quite a while. Far enough?" asked King.

"All x now, I guess—don't believe they can see the flash from here. Cut!"

The rockets died abruptly and a blast from the side ports threw the plane out of the beam—and once out of it, beyond range of the electromagnetic detectors as they were their coating of absolute black rendered the craft safe from observation. One dirigible rocket remained in action, its exhaust hidden from the enemy by the body of the vessel, and Captain Czuv soon recovered his senses.

"Wonderful, gentlemen!" he exclaimed, as he manipulated the delicate controls of his gunnery panel. "This is the first time in history that a Callistonian vessel has escaped from a hexan by speed alone."

An instantaneously extinguished flare of incandescence marked the passing of the hexan sphere into nothingness, and the cruiser shot back toward Callisto in search of more prey. It was all too plentiful, and twenty times the drama was reenacted before approaching day made it necessary for Czuv to take the controls and dive the vessel into the westernmost landing-shaft of Zhardk. A rousing and enthusiastic welcome awaited them, and joy spread rapidly when their success became known.

"Now we know what to do, and we had better do it immediately, before they get our system figured out and increase their own power," King reported to the Council. "You might send a couple of ships to Europa and bring back as many of the Tellurian officers as want to come and can be spared from the work there. They all test above forty-five meters, and they can learn this stuff in short order. While they're coming, your engineers can be building more ships like this one."

The new vessel did not make another voyage until nine sister ships were ready and manned, each with two Terrestrial officers and one Callistonian gunner. All ten took to the ether at once, and the hexan fleet melted away like frost-crystals before a summer sun. A few weeks of carnage and destruction and not a hexan was within range of the detectors of Callisto—they were gone!

"This is the first time in years that Callisto's air has been free of the hexans," Czuv said, thoughtfully. "With your help we have reduced their strength to a fraction of what it was, but they have not given up. They will return, with a higher acceleration than even you Terrestrials, powerful as you are, can stand."

"Certainly they will, but you will be no worse off than you were before—you can return to your own highly effective tactics."

"We are infinitely better off for your help. You have given us a new lease on life. . . ."

He broke off as a flaring light sprang into being upon the portal board and the observer of Exit One made his report—there was a hexan vessel in the air, location 425 over VJ-42.

"There's one left! Let us get him! No, he's ours!" Confused shouts arose from the bull-pen; but the original superplane was at the top of the call-board and

accordingly King, Breckenridge, and Czuv embarked upon an expedition more hazardous far than they had supposed—an expedition whose every feature was relayed to those in the portal by the automatic lookouts upon the rims and which was ended before a single supporting Callistonian plane could be launched.

For the enemy vessel was not the last of the low-powered hexan vessels, as everyone had supposed—it was the first of the high-powered craft, arriving long before its appearance was expected. Before its terrific acceleration and savage onslaught, the superplane might as well have been stationary and unarmed. After his long dive downward, King could not even leave the atmosphere—the hexan was upon them within a few seconds, even though the stupendous battery of rockets, full driven, had roared almost instantly into desperate action. Bomb after bomb Breckenridge hurled, with full radio control, fighting with every resource at his command, but in vain. The frightful torpedoes were annihilated in mid-flight; and nose, tail-assembly, and wings were sheared neatly from the warplane by a sizzling plane of force. Side rockets and torpedo tubes were likewise sliced away and the helpless body of the Callistonian cruiser, falling like a plummet, was caught and held by a tractor ray. Captor and captive settled toward the ground.

"This is a signal honor," observed Captain Czuv when he had revived. "It has been many, many cycles since they have taken Callistonians captive. They kill us at every opportunity. Is it your custom to destroy yourselves in a situation such as this?"

"It is not. While we live there is hope."

"Not ours. Unless they have made enormous strides in psychological mechanisms, they cannot tear from our minds any secrets we really wish to keep. That is useless," he went on, as King lifted a hand-weapon. "You will have no opportunity whatever to use it," and he was right.

A searing beam of energy drove them out of the vessel, then electromagnetic waves burned every metallic object out of their possession. Burning rays herded them

into the hexan sphere and into a small room, whose door clanged shut behind them.

"Ah, two are humans of a strange breed!" a snarling voice barked from the wall, in the Callistonian language. "Our deductions were accurate, as usual—it is to the humans of Planet Three, whose bodies are a trifle less puny than those of the humanity of the satellites, that we owe our recent reverses. However, those reverses were merely temporary—humanity, no matter what its breed, shall very shortly disappear from the satellites. Now, you scum of the Solar System, you shall be permitted to witness an entrancing spectacle on the way to our headquarters, where all your knowledge is to be taken from you before you die, lingeringly and horribly. There is a strange space-vessel nearing us probably searching for the one we took and which you dogs of Callisto must have been fortunate enough to take from us before we could study and kill its human cargo. Watch its destruction and cringe—and know, in your suffering, that the more you suffer, the greater shall be our enjoyment."

"I believe that," King acknowledged. As all three prisoners stared at the wall-screen, upon which was pictured a huge football of scarred grey steel, Czuv was amazed to see the faces of Breckenridge and King light up with fierce smiles of pleasure and anticipation.

"You dissemble well," remarked the Callistonian. "That will rob them of much pleasure."

"They'll get robbed of more than that," King returned. "This is too good to keep, and since they cannot understand English, I'll tell you something. I told you about Stevens. He apparently wasn't killed, as we thought. He must have escaped, and there is the result. That ship there is far from innocent—her being so far out of range of any of our power-plants proves that. That vessel is the *Sirius*—the research laboratory of the IPC—the Inter-Planetary Corporation! It carries the greatest scientific minds of three of the inner planets, and it is loaded with pure poison or it wouldn't be here. Oh, you hexans, what you have got coming to you!"

END OF PART II

Notice!

A few copies of the July issue of **AMAZING STORIES**
containing the first instalment of

SPACEHOUNDS OF IPC

by Edward E. Smith, Ph.D.

are still obtainable from the publishers at 25c the copy

The Time Hoaxers

By Paul Bolton

OUR present civilization has fallen heir to many legends, a number of them disclosed by hieroglyphics carved deeply into the stone by ancient civilizations. All of these have by no manner of means been deciphered as yet, so we do not know what marvelous secrets they may contain. But our present civilization will also leave records—vast numbers of them, since writing is not only for the few—records discrediting, with carefully calculated substantiating proof, seemingly amazing and impossible prophecies. Eminent scientists have committed themselves thus numerous times. Such a theme is ingeniously woven into a thoroughly novel sketch, which also affords a curious study of psychology. We are glad to welcome Mr. Bolton to our group of authors.

Illustration by MOREY

Author's Prologue

I WAS particularly interested in the "Time Hoaxers," because, as correspondent for *World News* in Austin, the task of chronicling the daily events in the lives of these queer persons who called themselves citizens of 2030 fell to my lot.

For four weeks I followed them daily, writing two stories each day for our telegraph wires, one for afternoon, and one for morning papers. Claiming no ability to write a narrative, I have simply arranged these news stories in chronological order, from the time the "time travelers" were first discovered in a Methodist minister's back yard to the time the strangers and their 1930 guest disappeared, presumably to return to their own day and time.

Since my task was simply to chronicle news events, there is in these dispatches no attempt to draw conclusions, or to pass upon that much disputed question of whether these men and the woman were visitors from another century, or merely perpetrators of an elaborate hoax, attempting to profit by the American public's well known gullibility.

A few words of explanation for newspaper usages, which may prove puzzling later, and I will retire as a first person narrator, to take up the task of news re-

porter, giving the news in the order in which it occurred.

The symbol—(WN)—at the beginning of each story in what newspaper people call the dateline, is the designation of the *World News*.

There may be some repetition, due to the standing rule in writing a news-story, that every story must tell enough of what has gone before, so that what follows shall be intelligible. While I have attempted to delete some of this repetition, I did not wield the blue pencil too heavily, preferring to maintain the straightforward newspaper style.

Many of the news dispatches were written by myself, out of Austin, Texas, thence to Kansas City, and from there to all parts of the world over our telegraph wires. I have taken the liberty to borrow extracts from a few articles written by special feature writers for the larger metropolitan newspapers during the hey-day of the "little men."

With these words of explanation, I submit the dispatches. They end on a questioning note. They reach no conclusions. Nor, perhaps, will the world ever conclude whether the tiny fellows from the empire of America were sincere, honest experimentalists, or dwarfs on a holiday.

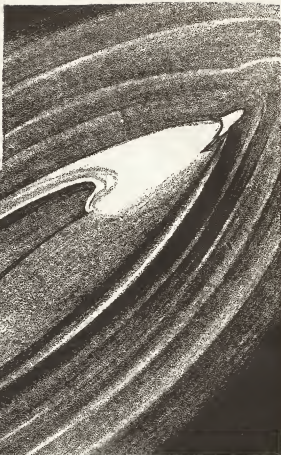
Sincerely yours,
Paul Bolton.

Coming of the Time Travelers

(News article published in the Austin, Tex., *Observer*, July 31, 1930.)

THE Rev. Dr. J. H. Atkins had strange visitors last night.

When the reverend awoke this morning he found, without a "By your leave" or "With your permission" an unusually shaped vehicle parked in his back yard. It looked like a cross between a young submarine and a modernistic airplane.



The machine hummed and quivered, and then apparently slowly melted into the air.

Dr. Atkins called his wife. His wife called the police. Police called on the Atkinses, and then called for re-enforcement.

When the fresh squad arrived, the officers, Dr. Atkins, and his family walked all around the machine and decided it was a rifle bullet, grown up and sprouting wings.

It appeared, according to the police, to be constructed of some glassy-like substance.

"It shivered in the sun," said Chief of Detectives Tim Ragan, "like a lake in a light breeze."

While examining the contraption, they noticed an opening in the top, from which a head was tentatively sticking.

"Come on out," shouted Detective Ragan. "You're under arrest for trespassing."

The head, followed by a body, came on out. After it followed another head, and another body, then three other heads, each followed by its body. Then came a fifth. Mrs. Atkins was allowed to describe it.

"It was a silvery head—the most beautiful hair I have ever seen in my life."

But Mrs. Atkins would not describe the body which followed. She blushed furiously when asked for a de-

scription by an *Observer* reporter, and all she would say was:

"She—it—was undraped!"

Which wasn't quite fair, because undraped wasn't the proper word. She wore a shimmering tunic and sandals. For that matter, the clothing of the four men was equally scanty.

Police Officer O'Rourke shouted:

"Besides trespassing, you're charged with indecent exposure!"

It was believed he meant "display" instead of exposure. But Police Officer O'Rourke was beside himself. Especially after the fifth figure came forth.

The man and the woman, according to police description, were unusual in only one thing. They were unusually small.

Their bodies appeared perfectly formed. A little spindly-legged, perhaps, as Dr. Atkins, who is partial to well-built bodies, observed. Otherwise perfectly proportioned, but the tallest a scant four feet six inches.

The shortest man, who also wore a thin band of some goldlike metal around his head, stepped forward.

"What year is this, please?" he asked. He had to repeat the question, for the police, and the Atkinses, had difficulty in understanding him. They said he talked with a queer accent.

"And what year are you supposin' it is?" rejoined Officer O'Rourke, who had by this time, become "thoroughly disgusted." "Did you think it was 1492, when Columbus crossed the Atlantic blue?"

The leader appeared crestfallen.

"Oh, 1492," he said. "Then America hasn't been discovered yet. Then what country is this?"

Officer O'Rourke is nothing if not patriotic. This irked his patriotism.

"Tell it to the judge," he snorted. "Come along, all five of you." And despite their protests, and attempts to climb back into their machine, they were carted off to the station and lodged in cells.

Officer O'Rourke told the tale to the *Observer*. He wouldn't allow newspaper men to see the strangers.

"They've got to get some respectable clothes, first," he said.

Reception of the Time Travelers

After the above story appeared, an opposition news service "lifted" it from the *Observer*, sending it out to their newspapers. Shortly after came an urgent message to me from Kansas City, couched as follows:

95 message:

PB: Austin

Opposition has good feature about strange machine in minister's back yard Stop Something quickly please.

Kansas City.

To which I replied:

Kansas City:

Am investigating minister yarn Stop Appeared fake to me Stop Will file soon as verified.

pb-Austin.

Then I visited Officer O'Rourke, et al., and wrote the first World News dispatch giving the world the story of the "Time Travelers."

AUSTIN, Tex., July 31—(WN)—Claiming themselves to be travelers from the year 2030, four men and a woman were held on suspicion by police tonight.

Charges of trespassing, violating parking regulations, and indecent display were filed against them. Police Officer H. T. O'Rourke signed the complaints.

The five persons and the machine in which they claimed to have traveled from the year 2030 to the year 1930 was discovered early today by the Rev. J. H. Atkins, minister of the First Methodist Church.

Police, called to the scene, discovered the occupants of the machine and immediately took them into custody on the charges listed above, and on the additional suspicion of swindling.

When they dismounted from the machine, police said, they wore only short skirts for clothing. When seen by a World News correspondent, they had been clad in civilian clothes.

Their names, as given to police:

Iran, the leader; Alton, Jenó, and Redil, described by police as "the crew"; and finally, Anis, a girl with hair of a strange silvery hue, who said she was about thirty-five years old, but whom police believe to be nineteen.

The men's ages were estimated from 25 to 40.

At a preliminary hearing before Justice of the Peace Jakowitz, the "Time Travelers" told their weird story.

Iran, speaking slowly and with apparent difficulty—having a marked but unidentified accent—acted as spokesman for the group.

"We," he said, "are citizens of the Empire of America, all born in the twenty-first century.

"We come to you as ambassadors of good will, to tell your men of science of our achievements, to shorten and make lighter the burden of civilization in traveling the path of progress, to place you a hundred years ahead of your time on that path. We come as official representatives of the People's Government, Empire of America."

A disgusted snort interrupted the proceedings. It was from Officer O'Rourke, who, preceding Iran on the witness stand, had told how the arrests were made in the minister's back yard.

"It's a blasted lying tale he's telling, Judge," O'Rourke shouted. A burst of laughter was quieted only by the pounding gavel of Justice Jakowitz.

"I shall cite you for contempt of court if you interrupt the court again, officer," the justice observed. O'Rourke quieted down, and Iran resumed his tale.

"We studied your histories, your customs, your languages," Iran continued, "before attempting the trip. Our wisest men advised against it. They said we could hope to be received only as impostors and fakirs, that our plans were an attempt to change the course of history, an illogical impossibility. They said we would find only twentieth-century barbarians, suspicious, ill-tempered, likely to do us bodily harm.

"We could not believe these advisors. We believed in the essential humanity of man, even twentieth century man. So we made our trip."

He then launched into a technical explanation of how the alleged trip was accomplished, flatteringly outlining a theory of time which professors at the University of Texas later compared to the Einstein theory of space. How time was "curved" in a never-ending stream, and now, with proper machinery, the "curves" could be bridged.

In the midst of this technical discourse, which none of his audience was able to follow, Iran was interrupted by Judge Jakowitz.

"Now," said the justice, "tell us the truth."

"The truth?" Iran effectively simulated bewilderment.

"But it is the truth!"

"Bond fixed at \$500 each," said Judge Jakowitz. "Next case."

The strangers, appearing confused, were hustled off to jail. They said they could not make bond, after Iran had demanded what "bond" meant, and it was explained to him. They said they knew no one in Austin who would be surety for them.

Authorities were reluctant to discuss the case tonight, declining to anticipate the next move.

The Hoax Uncovered

HOLLYWOOD, California, August 1—(WN)—Private note to editors: We have learned from reliable sources* which cannot be divulged at this time, that the self-styled "time travelers" in Austin, Tex., are the advanced guard of a publicity campaign which will precede the release of a futuristic picture by PictureVox, Inc. The following story embodies this information, used despite its tinge of advertising, to prevent more hoaxing.

* * *

HOLLYWOOD, Cal., August 1—(WN)—The "time travelers" in Austin, Tex., who claim to have come from the year 2030, came all the way from Hollywood, where the nutty schemes come from, it was learned on unimpeachable authority today.

Picture Vox, Hollywood producers of "See and Hear" pictures, on a location carefully hidden away somewhere in the southwest, is engaged in filming a fantastic picture of the future, explicitly, of how America may appear in the year 2030.

Those same publicity stunt stagers who thought up that one about the movie "wild girl" going to Tia Juana and losing her life savings—just before the advent of a picture with an identical episode—have planned the advance advertising on "America, 2030," tentative title of the picture.

To lend a semblance of reality to their advertising, the press agents drew upon the army of extras, from which were selected four men and a girl of unusually small stature. The "time machine," according to the irreproachable informant, will appear in the forthcoming picture. It was transported secretly to Austin, not through time, but in a box car.

They had hoped to "wool" savants at the University of Texas and thereby gain nation-wide notoriety at the expense of the citizens of Austin, it was learned.

* * *

Message PB: Austin

Interview Iran for folo.** Also president University and any officials.

(folo Hollywood)

AUSTIN, Tex., Aug. 1—(WN)—Iran, spokesman for the alleged travelers from the twenty-first century,

*The reliable sources, it was disclosed later, was Audible Films, motion picture producers and chief competitors of PictureVox, attempting to discredit their business rivals. This fact has never been revealed before outside the *World News* organization.—F. H.
**Folo is press association jargon for "follow," indicating that the story so guided should be printed with another story from another city on the same subject.

vehemently denied to *World News* today that his party had any connection with PictureVox, Inc.

Iran and four companions were held in city jail today on several charges following their discovery yesterday morning in the backyard of the Rev. J. H. Atkins.

Iran's comment was made when shown a dispatch from Hollywood in which it was claimed that the self-styled travelers through time were the advance guard of a publicity campaign for a forthcoming PictureVox production.

Police officers, on the other hand, greeted the dispatch as a solution to their troubles, and immediately wired PictureVox to send money to pay the fines.

Dr. L. V. Newstone, president of the University of Texas, through his secretary, said he had suspected the persons were perpetrators of a hoax.

"While time traveling may be possible in science fiction narratives, it is manifestly physically impossible in reality."

He said he would not grant the persons an audience with him, nor would he permit any members of his faculty to interview them, declaring that would be fresh fuel for their publicity fire.

Prof. H. K. Verone, head of the Department of Astronomy, concurred in President Newstone's statement, adding the comment that there should be a law against publicity writers hoaxing a gullible public.

* * *

(From a daily feature published in the *New York Enterprise*. Dated Aug. 2, 1930. Reprinted with permission of copyright owners)

By Buster Bronx

Turn forward, turn forward, oh Time in thy flight! Or backwards, or sideways, as you think is right.

These time travelers are racing against Time, and they must be making him a pretty good race.

*

Planning to prank the old boy, they turned around and ran the other way while he wasn't looking.

*

Such dishonesty is enough to make the old boy grey haired before his time.

It's rather confusing, this time traveling.

*

You crawl in and push the lever backward, and Presto! there's the Pilgrim Fathers, stretching their legs on Plymouth rock and complaining about the service *en voyage*. Especially about the terrible bar. Ran out of fizz water.

*

Then you push the lever forward and sneak up on great grandson following his inclination (probably a blonde) in some futuristic night club.

*

If you didn't like the way Grandson Harold parted his hair—

*

Leave him out of your will. Even forget to provide him with a father.

Suppose one of the time travelers should forget to return to 2030.

*

He would settle down, raise a family, die of old age—all a hundred years before he was born.

Imagine his father saying: "Son George died a hundred years ago."

*

It is confusing. We're all mixed up, thinking about it.

*

And speaking of thinking, what do you suppose old Father Time thinks about it all? We wager he resents it. We would, if we were the old gentleman.

*

But you've got to hand it to them on one count. They've found a brand new way of beating time.

* * *

AUSTIN, Tex., Aug. 2—(WN)—Police today received a telegram from Hollywood, Cal., signed by S. K. Mauritz, president of PictureVox, Inc., denying that the so-called "Time Travelers" held in jail here were connected with his organization.

The message stated that PictureVox planned no futuristic picture; that police were at liberty to inspect all their records and examine all their locations; and that the report of *World News* implying a publicity scheme was a "rank falsehood."

Officer O'Rourke, who has taken a leading part in this real or "reel" drama, declared the group, if not connected with PictureVox, probably was hired by some other company.

"Either that," he stated, "or they're a bunch of lunatics."

Tragedy Threatens Time Travelers

AUSTIN, Tex., Aug. 3—(WN)—Sam Johnson, chain store grocery clerk, was killed today, apparently by a charge of high voltage electricity, and five members of a group of alleged time travelers were charged with murder in justice court in connection with his death.

Johnson's death was the aftermath of a decision of Austin officials to release the members of the party and give them a chance to prove their claims.

The clerk was fatally burned when he approached the machine after telling friends he planned to break off a portion of the crystalline substance on its projecting wings as a souvenir.

The suspects, accompanied by police, had gone to the home of the Rev. J. H. Atkins in this town, where the strange time machine was supposed to have "landed" on its trip from 2030.

Iran, spokesman for the group, had said they would make the machine disappear before the eyes of spectators, as proof of their claims.

Redil, one of four men in the party, climbed into the machine, the other four being held outside by police as hostages.

A crowd of spectators was on hand. All were warned not to approach too close to the machine.

Redil climbed down through the entrance atop the bullet-like machine. Soon a curious humming noise was heard, and the machine appeared to shimmer in the sun. Some spectators said its lines grew vague.

At this instant Johnson broke through the crowd and jumped toward the machine.

Iran shouted at him and attempted to run after him, but was held by police, who thought he was trying to escape.

Johnson reached out for the wing-like projection, shaped like a fish fin. He screamed.

The Rev. Atkins said he would take an oath that the man's hand partially disappeared.

There was a harsh grating roar, as of gears in a truck, as Johnson slumped across the machine and it stopped vibrating. Redil climbed out and bore the man's body away from the machine, but all efforts to revive him failed. The coroner said his death was due to shock and burns.

* * *

AUSTIN, Tex., Aug. 4—(WN)—Celebration of the Declaration of Independence had no place today in the plans of a group of five persons, claiming to be from 2030, who are charged with the murder of Sam Johnson.

Capping all their other troubles, they claimed today that their "time machine" had been disrupted when Johnson, seeking a souvenir, broke off a part of a wing-like projection on the bullet body.

This declaration led authorities to abandon their first theory, that Johnson's death really was accidental. John Jilco, District Attorney, said it was evident that, because the machine was not what it was claimed to be, the suspects had used Johnson's death as a subterfuge, to avoid substantiating their claims.

* * *

(From an editorial in the *Austin Observer*, August 7, 1930.)

Five hare-brained individuals, whose publicity stunt has resulted in the death of one of our citizens, are lodged in jail, charged with murder, their trial set for August 15.

Claiming they are citizens of a future age, these exorable persons, after insulting the intelligence of Austin, Athens of the Southwest, add irreparable injury to insult by carrying on their ghoulish pranks at the cost of a human life.

If the district attorney sees his duty as we see it, he will demand the extreme penalty for these dangerous jokesters.

* * *

By Dorothea Dayton
Special Writer for *World News*
(Copyright, 1930)

AUSTIN, Tex., Aug. 8—(WN)—A modern knight has come to the rescue of a lady who claims to be ultra-modern.

The woman in the case is known only as Anis, silvery haired and diminutive member of the crew of the "time ship"; she's held as a principal in the murder of Sam Johnson, souvenir seeker.

Anis, as the world now knows, came to Austin in a queer vehicle with four men, all of whom claim to be citizens of the Empire of America, 2030 A. D. After a hectic experience in this "new land," the death of Johnson when he touched the vibrating machine landed all five in jail, apparently without friends, doomed to go to trial on a charge of murder, perhaps to be incarcerated for the rest of their lives.

What a queer fate that would be—citizens of 2030, dying a century before they were born!

But Miss Anis was free today on bond of \$5,000, with Jason Copeland, university student, her surety.

His fraternity brothers describe Jason as the "Greek God" type—fitting mate for silvery Anis! He is blonde, rather small in stature, but still towering above the petite form of Anis.

"Yes," said the girl from the next century, "I love him. Why shouldn't I admit it? We of the twenty-first century have no false modesty in admitting love."

And because of love, she was free.

Drawn to the jail by curiosity, shared by scores of his schoolmates, Jason stayed to pity the apparently friendless girl, and finally, because pity is akin to love, to love her.

"I couldn't stand to see her in that filthy place any longer," Jason told *World News*. His winning smile and fearless brown eyes gave ample reason for the quick blossoming romance.

They walked from the jail, hand in hand.

"What do you plan to do now?" they were asked.

"I am going to fix the ship," Anis replied, and, to a surprised query, "Why certainly, I shall be able. I helped construct it."

"Then when I have it fixed, we will all go back to our own time—Jason with us."

Jason expressed confidence that the murder charges would be dismissed, or, if they went to trial, that they would be found not guilty.

Anis attempted to describe her real or fancied world for your correspondent.

The towering buildings, reaching up to unfathomed heights, so often pictured in visions of the future, were strangely lacking. Instead, this land she described had a queerly rural atmosphere.

Great cities there were; but their greatness rested not on size but on intellectual value. The cities were the storehouses for the finest in art, literature, sculpture, painting and music.

Roads were shining sheets of metal, over which noiseless cars carried the suburban dwellers to the cities for recreation or knowledge.

She told how these cities sprang up, in the short space of an hundred years, from the brain of one who planned them to take care of surplus labor, a problem which first began to be felt critically in 1930, and which grew steadily worse for several years.

The cities themselves, as Anis described them, were masterpieces of the architect's craft, in minutest detail.

Building of these cities, coupled with a rapid decline in the birth-rate, as the knowledge which made this possible was legalized as an emergency measure, gradually brought about an increase in leisure.

The people, with more time to think of their government, gave it more attention, and finally took possession in fact of what had been theirs nominally since the Revolutionary War, Anis said.

The older commercial cities "of 1930" now were reduced to mere commercial depots, Anis said, people preferring to live either in the simple homes which dotted the country-side, or in the clean cities of almost perfect plan, which were theirs for the asking and building.

The crisis of 1929-35, Anis said, was the last downward turn in the economic cycle. The bottom was definitely reached in the summer of 1935. Then the reconstruction period began, rapidly gaining impetus and resulting in what she termed literally a new era.

With more leisure, active minds turned to probing the mysteries of nature, Anis said.

Many marvelous inventions, which seemed commonplace to Anis, resulted from these probings into the unfathomable depths of the natural world. Among these achievements, Anis said, was the time machine.

Three years were spent in constructing the machine, she said. There was no precedent, except theory; no working model; no ready-made parts to be put together.*

Every detail of the trip had been carefully planned, she said, and their calculations had shown they would "land in the year 1930." They had not, however, expected the reception they received, and planned to return to their own "time" at the earliest opportunity.

AUSTIN, Tex., Aug. 9—(WN)—Trial of the five self-styled "time travelers" for the murder of Sam Johnson was set today for Aug. 20 in District Court here.

The Trial

AUSTIN, Tex., Aug. 20—(WN)—Insanity will be the plea of the five "time travelers" charged with the murder of Sam Johnson, it was disclosed today, as they were called for trial.

Iran, spokesman for the group, elected to be tried first. When he told the court he had no attorney, John Stebbins was named by the court to defend him.

After a short conference with Iran, Stebbins announced that he would plead insanity.

"It's an open and shut case," he told newspapermen. "They're either on some elaborate publicity stunt or they're a bunch of cock-eyed pseudo-scientists, crazy as loons. If the first, some one will come forward to claim them. As yet, no one has. I anticipate no trouble in proving them all insane."

Iran protested vigorously that he was sane, but the lawyer, appointed by the court, persisted in his defense, and the court held that the accused must abide by his lawyer's decision.**

AUSTIN, Tex., Aug. 21—(WN)—Iran, spokesman for a group of five persons who claim they are from the year 2030 A. D., was found not guilty of the murder of Sam Johnson, in District Court today, by reason of insanity.

The jury's finding, however, automatically commits Iran to the State's care as an insane person.

The three men companions of Iran elected to abide by the jury's findings.

Johnson was electrocuted when he touched the strangely shaped machine in which the persons claimed to have traveled here from the next century.

It was one of the shortest trials in the country's history, consuming less than two days. Some difficulty was encountered in obtaining a jury, since the facts of their arrival have been widely broadcast; but after the jury was completed late yesterday the trial was concluded speedily.

Only three witnesses were put on the stand: Officer H. T. O'Rourke for the state, who first arrested the party as vagrants; the Rev. J. H. Atkins, in whose back yard the machine was alleged to have landed; and Dr. A. B. Cooke, expert alienist for the defense.

*Miss Dayton told me later that Anis had described, in some detail, the principle of the "time machine" and that she had faithfully recorded the interview in shorthand. However, the telegraph editor "cut" (deleted) this portion, and Miss Dayton, in true reporter's fashion, destroyed her notes. Press wire space is valuable, and the editor apparently considered these details—which he probably thought pure fancy—inconsequential.—F. B.

**Only one other similar case has come to my attention in reporting trials. At Houston, Tex., a lawyer persisted in his plea of insanity for his client over all objections. In that case, however, the trial judge ruled that the man should be allowed to plead he was sane, the lawyer appealing to the highest criminal appeals tribunal in the state. This court refused to disturb the trial court ruling, without, however, passing upon whether a lawyer or his client may guide a trial.—F. B.

After describing the coming of the travelers, their strange guise and actions, Officer O'Rourke told how Johnson met his death, while the travelers were being given a chance to prove their claims.

Under questioning of the defense attorney, O'Rourke admitted the prisoners had "acted queer."

"All they've done since they've been in jail," he said, "is to rant about wantin' to see our 'great scientists' and to 'see the president or ruler.'"

"They shoulda pulled their stunt in Washington," he added, drawing a strenuous objection from the defense counsel and a rebuke from the court.

Dr. Cooke testified that in his opinion Iran and his fellows undoubtedly were insane. He described their especial phobia, which he said probably was induced by excessive reading of fantastic fiction.

Only Anis, the woman member of the party, will have a separate trial. Counsel was retained for her by young Jason Copeland, university student and admitted lover of the young woman, who obtained her release on bond several days ago.

The others will be taken soon to the State Prison for the Criminally Insane.

* * *

(From the editorial column "Tomorrow," reprinted by permission of copyright owners.)

"Tomorrow"

By Bradley Briggs

(World's highest paid editorial writer)

Regarded as harmless pranksters, five persons at Austin, Texas, have, through the death of a souvenir hunter, focused World Wide attention on themselves.

The souvenir hunter's death was undoubtedly accidental. In a larger sense it may be regarded as incidental, if claims of the five are true. They say they came from the next century, in a time-traveling machine.

* * *

No one professes to believe their claims. Yet equally notable is the fact that no man of eminence has disputed their claims.

To our minds, time traveling is impossible, as was air travel to our forefathers, and train or auto travel to our fathers' fathers.

It is as incomprehensible to us as a simple wheel would have been to a caveman. It tickles our risibilities, as did Fulton's steamship.

* * *

Time traveling, in theory is not new. H. G. Wells, pioneer in the field of imaginative fiction, wrote a classic around the theme. It's called "The Time Machine." If you haven't read it, get it, read it. Then forget any preconceived notions you may have had about these persons and listen to them with an open mind.

Picture time as a stream, flowing endlessly. A motor boat on a stream of water has no difficulty in resisting the current's flow. Similarly, an airplane overcomes for its purposes the pull of gravitation. Who are we to say that a hundred years hence men wiser than we may not learn to overcome and conquer the flowing streams of time?

Unfortunately, our minds are not so disposed to welcome the strangers as honest until they are proved dishonest. The mistake of the time travelers, if they really be time travelers, was in attempting to imprint 2030 ideas

on 1930 minds. Inability to throw off preconceived ideas has been civilization's greatest handicap.

* * *

(From the "Open Column," *Chicago Sun*.)

To the Editor:

Please cancel my subscription to your newspaper. I consider Briggs' editorial yesterday an affront to my intelligence and have no desire to continue reading a journal which subscribes sufficiently to his wild notions to print them on its front page.

In his editorial, Briggs called the death of a human person "incidental," and knowingly or unknowingly submitted a brief for the most un-moral persons who have graced the front pages of our daily newspapers in many days. His editorial condoned not only murder, accidental or incidental, but also condoned immodest dress and the fact that one young unmarried woman, who now admits her love to a college pup, accompanied four men—whether on a prank or a trip through time(!), dressed, if the newspapers may be believed, in a very gauzy skirt. Fine examples for the younger generation.

If they are from 2030, thank God I live in 1930!

Your former subscriber,

Ezra Greatheart.

* * *

The Going of the Time Travelers

AUSTIN, Tex., Aug. 30—(WN)—In a sensational escape which combined all the thrills of the old-time stage coach holdup with modern eight-cylinder romance, the "time travelers" made a break for freedom today—and succeeded.

They were last seen by the persons who first saw them—the Rev. and Mrs. J. H. Atkins, in whose backyard the "time machine" landed just a month ago. Eluding two sets of officers, the time travelers climbed into the machine, set into motion its machinery, and disappeared.

The "take-off" was witnessed by the Atkinses, police and a World News correspondent, all of whom, immediately afterward, were ready to swear under oath that the machine apparently dissolved before their eyes.

The first break was made while the four men members of the party, who had been adjudged insane at their trial for the murder of Sam Johnson, souvenir hunter, were being taken to the prison for criminally insane.

The closed van was manned by a driver and a guard. The driver, Lars Jensen, said that about two miles out of Austin a car was seen over-turned in a ditch. There were no other passersby, and so Jensen slowed down. The guard, Dewey Cox, believed he heard sounds issuing from the wreck. Wheels of the car were still spinning. Since the van was securely locked, the men did not fear to leave it, and moved by humane impulses they got out to investigate.

They were met by Jason Copeland, college youth who had fallen in love with Anis, woman member of the party, with an automatic pistol in his hand.

After taking their keys and securely tying the driver and guard, Copeland headed the van back toward Austin.

He stopped in front of the minister's residence. Three police officers, including Officer H. T. O'Rourke, were guarding the "time machine" while Anis, Copeland's sweetheart, was working on repairs inside.

The inside of the machine never had been examined, since authorities feared to touch it after Johnson's tragic

death. Johnson was burned to death when he attempted to break off a portion of the fragile wing as a souvenir.

Officer O'Rourke and his companions were sitting inside a garage at the rear of the minister's home, to avoid the direct rays of the sun. They did not see the van stop.

Copeland came around the house and engaged the officers in talk. A *World News* correspondent, who had called for an attempted interview with Anis on her pending trial, also was in the garage.

The college student, standing just outside the swinging doors, suddenly reached for them and slammed them shut, shooting in the bolt.

Taken by surprise the officers seemed unable to move, but an instant and they threw themselves against the door, breaking it down. They saw Copeland descending into the door of the machine, like the hatch of a submarine on the bullet-shaped contraption. The machinery already was humming, and Copeland's last words were: "Don't come too close!"

He pulled the door shut after him, the machine hummed and quivered, and then, apparently, slowly melted into the air.

There seemed to be a gust of salty air, and Officer O'Rourke swore that cold fingers played over his face. Mrs. Atkins, who with her husband came to the rear door at the officers' shouts, fainted.

The van was seen in front of the house, and the guard and driver loosed, following which the entire party adjourned to the District Attorney's office.

The District Attorney and other authorities scoffed at the story, despite the presence and witness of the minister and his wife. They declared the whole party must have been mesmerized. A fresh squad was sent to the minister's home, but all they found was the place where the machine had rested, the grass burned entirely away.

Authorities in nearby towns were notified, but at a late hour today no trace of the fugitives had been found.

* * *

Epilogue

So ended the newspaper version of the "Time Hoaxers" except for one episode which might better be termed an anti-climax. But before you read it the compiler of this unique record is forced to intrude once more with the personal pronoun.

This episode adds little to the solution of the mystery—adds, in fact, to the mystery. All of the document has been published before with the exception of the paragraphs starting:

"Yet there is one to which I call your particular attention."

When you see that sentence, remember that we feared to publish it. At my special request, the editor of the *Observer* deleted a large portion of the manuscript. Had it been published, undoubtedly I would have been accused of having connived with the "Time Travelers." I would have had a devil of a time convincing them of my innocence, since I can't explain it to myself.

With this final explanatory note to precede the final clipping, I close, still without comment, the newspaper story of the "Time Hoaxers." Where the six persons went has never been learned; perhaps shall never be known, if their story was true, until the histories of some era after the year 2030 A. D. shall have been written.

(From the *Austin Observer*, September 2, 1930.)

(Foreword by editor: The following communication, came to the *Observer* by registered mail today, just three days after the disappearance of the Time Hoaxers, who apparently took Jason Copeland, University student, with them.)

It is signed by the name Jason Copeland. Whether it is another hoax to add to the long string already foisted upon the citizens of Austin, the editor is not prepared to say.

We are publishing it, however, because of the local—nay, world-wide interest, evoked by the occurrences of the last four weeks. Accompanying Copeland's letter, assuming he really wrote it, was a set of newspaper clippings, yellowed, apparently by age, yet all bearing dates of the past month. The letter claims these were brought from 2030 to 1930.

These clippings may be seen by authorities or by the general public at our offices.

The letter was postmarked Aug. 29, the day prior to the disappearance. It was mailed from Austin, to a friend of the editor in another state, with a request that it be forwarded to us. This was done.

The letter follows, virtually uncensored.

Austin, August 29, 1930.

Editor, *The Observer*:

When you receive this communication I shall be, I am confident, in another and a better, a less prejudiced century, where strangers are not accused of criminality and insanity simply because they are strangers with strange dress and customs.

Because I was a citizen of 1930, and reasonably or unreasonably hope for vindication in the eyes of my many friends, I should like the world to know why I left.

As has been told in the columns of your paper, I left primarily because of Anis, to be with her. That we love each other, neither of us deny. Before either of us was born, she in the twenty-first century, I in the twentieth, that was predestined.

I first saw Anis in a smoke-laden room of a Justice of the Peace. Over the heads of many other curious spectators our eyes met, and both knew we had met before.

I went to the jail soon after. When she saw me she called me by name.

To retell the story she told me would be futile. Anis and her companions attempted to tell it time and again. They were laughed at, scoffed at, ridiculed in the press, refused interviews with supposed men of brains, when all they asked was the opportunity to impart the priceless gift of a small store of their knowledge.

When I arranged for Anis' freedom I did so with no other motive than to remove her from the filthy jail where she was kept. But for days thereafter I was her constant companion. I aided her in repairing the fragile wing of the time ship. I watched its marvelously simple mechanism, although never able to grasp its principles.

The proofs I am about to present you I did not have myself until yesterday.

Yesterday Anis said to me:

"Jason, it is time to go."

"Go? Where?" I asked.

"Back to my own time—our own country," I laughed at her. I, despite my close acquaintance with her, still could not fully believe, but loved her despite my disbelief.

Then she showed me the proofs, and told me how she acquired them.

(Continued on page 445)

Illustrated by
MOREY



"Noen, the element, comes, or is poured into our valley at such a temperature that, despite our surrounding climatic conditions, it keeps our valley green and our atmosphere at a constant degree of temperature."

The Forgotten World

By E. Bauer

ONE of the most alluring things about hilly country and mountainous regions is the veil of mystery that hangs over each elevation ahead of us. One always wonders what lies over the hill, but it is not frequently that we indulge that curiosity to the end. What the relator of this tale found only a little way from the explored country at the South Pole amazed his friends and will amaze our readers, no less. It is not at all impossible that there might be such place as he tells of on our globe.

USUALLY there were four fellows that could be found together during our college days. They were Jim Malestrom and Pal Johnson, who were working their way through, and Bud Layton and myself, who had incomes in excess of our needs.

Seven years after we graduated Jim was known as the youngest mate of ocean steamships with a captain's license.

Pal, by this time, had earned the reputation of being one of the most careful aviators of our country and an airplane engineer of unsurpassed ability.

But everybody knew Bud, not only at home but abroad as well, for, although he had been a serious student of theology and had intended to become a preacher of the gospel, aviation became his hobby, and, despite his inclination, he became the most popular hero of the flying world. At no time did he seek to take away the glory rightfully belonging to Lindbergh, for he felt Lindy was the pioneer; he was just following his footsteps.

"I know," he said, "I have flown more, and perhaps made longer trips than he has; yes, I have crossed the North Pole and all the seas in several directions; I have covered every continent and visited most of the nations, but I have had the advantage of the knowledge and experience of Lindy and all those others who have preceded me. In addition, I have had planes of greater speed and greater flying ranges. All I did was to follow paved roads, with tested equipment with which to do it."

As to myself, I probably became interested in more of the sciences than all three of my buddies put together—navigation included. My time, since I carried away the beribboned sheepskin as an alumnus, has been spent on the seas, on ships whose missions were to learn the

currents under different conditions and delve into the mysteries of the life contained in them."

Upon my last visit home the Pater, who was very much interested in my work, said: "Son, I know you are all wrapped up in your endeavors and you are doing a great work, but as a business man you do not know a damned thing; you probably know all about most of the fish that swim and how hot or cold it ought to be in the Atlantic two miles off shore, but you don't know what a dollar will buy. While you were away I had quite a few meetings with men and students in your line of work, and between us we planned what we believe to be the finest and best equipped ship for sea investigation ever dreamed of."

"Having gathered this data I had the ship built for you; in addition, I have created a trust fund which will meet the operating expenses of her for the rest of your life. My doing this now will help you to realize your ambitions earlier in life than you expected. That alone gives me a great deal of pleasure. Besides, I know the money has been well spent."

I tried to express my gratitude, but he waved me aside and continued: "Your old-time buddies are aboard her now, down at the pier. Jim, until such a time as you see fit to change, will be your sailing master. He has already arranged for the crew. Pal has taken the position of chief aviator, and Bud is there with them as your guest. It is up to you to choose your scientific co-workers. So hop to it, my boy; she is yours to go where you will and stay as long as you like. I only hope you will enjoy life on her as much as I have enjoyed seeing her brought into being."

It did not take me long, after dad finished, to jump into a taxi and get aboard the *Investigator*, as the ship was named. We had a rollicking reunion. The only thing that marred our pleasure was Bud's absolute refu-

sal to come with us. However, he promised to join us after he made one more solo flight which he had planned—a trip from New Zealand over the South Pole, to any point where we might agree to meet him in the Antarctic Sea. Our attempts to dissuade him from such a flight were of no avail.

Finally, since he remained adamant, we gathered about him to help lay out his route. At best he would have to go over considerable unknown territory, but knowing distance and direction as he did, we could make him see no reason why this trip should prove any more hazardous than any of the other trips he had already made.

So we arranged to meet him in Discovery Bay, the most southerly point we could sail to. It was from here that Byrd started his successful trip to the South Pole in 1929.

Our trip to Discovery Bay was uneventful. It did, however, give us ample opportunity to learn that the *Investigator* was even more sturdy than the *Pater* claimed for her.

FROM the beginning of his flight Bud kept in constant communication with us by radio. Everything seemed to be going fine until he passed over Amundsen's monument at the South Pole. From then on we heard no more from him.

Allowing what we considered plenty of time for him to reach us, I sent Pal out in his plane to meet him, but he returned alone.

The following ten days two planes were out looking for him. A photographer went with each plane, and pictures were taken of all the territory they covered. The plates were developed immediately upon their return and examined for signs of life or smoke.

Unfortunately we were in the bay at the wrong time of the year. I saw that Jim was getting nervous. "Doc," he said, "we will have to get out of here. Personally, I would be willing to stay here until hell freezes over if I thought we had one chance in the world of finding Bud, but he had enough food to last him only two days; fourteen days have gone already. At the best we could not find him alive, and I no longer want to carry the responsibility of the lives of those with us. We have only supplies enough to last us about forty days, and if we don't leave soon we will freeze in and will be stuck here for at least eight months."

Knowing we had looked for Bud over a territory a hundred miles wide, and realizing that Jim's reasoning was sound, I, too, felt we must go, and for that reason I gave orders to make for the open sea. I also dictated a radiogram that search had been abandoned, although in our hearts we felt that Bud was still alive.

This is really to be Bud's story, so instead of going into further details as to the adventures of the *Investigator* I will refer you to the annals of the International Geographic Society.

Some time ago, about thirty years after we deserted Bud, we received a report of an earthquake-like disturbance somewhere south of us. In an attempt to learn what had happened we came to Discovery Bay once more.

Jim, Pal and I were the only ones aboard that had ever been there before, and our minds dwelt not on the recent earthquake but on Bud, our old buddy whom, we somehow felt, we had deserted so many years ago.

As a matter of fact, we did have Byrd's maps and the information he had gathered spread before us, so as to map out our campaign, but these had been pushed aside, and we were going over the photos and data we ourselves gathered when we were in the bay so long ago, hoping against hope that we could discover something we had overlooked before.

Our work was interrupted by the radio operator, who brought in the following astounding message:

SHIP INVESTIGATOR, S. O. S.—Heard your weather report and location. Am about two hundred miles due south of you. Am nearly exhausted. Look for forest fire; good landing, frozen lake. BUD LAYTON.

As we read we gasped. For what seemed to be ages we sat as though stunned. "A funny joke," whispered Pal. "Impossible joke!" "You are all crazy," I cried. "Bud is out there, and he wants us. Operator, you get to pounding that key. Tell Bud I am coming for him, and keep on telling him so until you know he has heard you or you hear from me. Call all other work off for today. Get the four-seater ready; Pal, you drive her; come on, Jim, get into your flying togs. We are going after Bud and this time we are going to bring him home. I know just where he is; he is right here (pointing to a spot on one of our photos). He says he needs us; says he is nearly exhausted; why don't you show some action? You read the message—get a hustle on—it's our own Bud."

THE younger men about us probably believed we were out of our heads, and I don't blame them. Talking about deserting a man thirty years ago in a frozen land and expecting to find him now! In a few moments the propellers were spinning; Jim had an armful of blankets, a camera and a thermos jug of hot milk. Pal was at the controls; I had a medicine kit and a pair of binoculars, and we were off.

Within an hour after the receipt of the message we sighted the smoke. Bud was there, and he was alive; I found it hard to think connectedly. How could it be true? I thought my heart would burst; I tried to imagine how my buddies felt.

Pal seemed to drive by intuition. Long before I spied a figure on the ice with the aid of my glasses, he was descending, getting ready for a landing.

We taxied along on the ice and stopped within a few yards of where Bud stood. Jim and I were out of the plane and rushing toward him not more than a split second later. For a minute or so I did not recognize him, for he was bearded and wore a toga-like garment. Good old Bud, he tried to come and meet us, but in doing so he staggered and fell. We picked him up and lifted him into the cabin of the plane. Before we were ready to go, after he had sipped a glass of hot milk, he seemed to regain a little strength. "Same old pals, always looking for me," he said. "Never give up; I am pretty weak, but I am going to live long enough to say hello and tell you some of my experiences. I have been through hell for the past few days—I don't know how many. Don't give me any medicine, excepting one of these pills every four hours. I'll be all right, but I must rest now."

We had no trouble on our return trip, and within four

hours from the time we left the *Investigator* Bud was asleep and resting quietly in the berth assigned to him so many years ago. The following day he seemed quite strong and began his story:

"I am sorry, boys, that I caused you so much worry years ago. Aside from that I have no regrets. I appreciated the search you made for me and was sorry I could not thank you. I could hear your radio messages, but I was so situated that I could not answer them. It was fortunate, in a sense, that you did not locate me, for, had you found me—had you gone over one more mountain, you, too, would probably have been among the missing.

"To say I am glad to be with you again does not begin to express my feelings. But I know my visit will not be for long. I would like to live long enough to write a detailed report or history of my experiences, but that is not to be; so I am going to tell you what I can of my amazing experiences.

"I had better go back to the beginning—to the time when you, aboard this same good old ship, no longer heard from me. As you already know, everything went well until I radioed that I had passed over Amundsen's monument at the South Pole."

At this time Bud was again frightfully weak. I passed him a glass of water, which he drank slowly, after which he continued:

"Soon after passing over the pole I made up my mind to take a short cut and go over the mountains instead of following Byrd's route, as I had originally intended. All would have been well had I not run into a storm. I crossed the first mountain, at about twelve thousand feet above sea level. I was then full of confidence and highly elated over my success so far. As I crossed over the next mountain my troubles began, for the snowstorm I ran into was the heaviest it had ever been my fortune or misfortune to experience. I looked in all directions for a means of getting around, under or over it; I knew there were mountains on all sides of me, and I also realized that I was in a bad predicament, for the snow, a quarter of an inch thick, stuck to the wings of my plane and froze. This soon made it so heavy that, in spite of my efforts to gain elevation, I found I was flying at ten thousand feet and still going down. I was then too low to turn around and go back, and I did not know how high the mountains ahead were.

"God was good to me, however. Suddenly, to my right, I saw a rift in the storm and discovered a valley that was almost clear. Turning in here, I found I was flying at eight thousand feet and within about a hundred of a rock-strewn bottom. I had no choice; I had to follow it. As I went along the valley gradually dropped, but it dropped no faster than did the plane, which kept going down on account of the weight of the snow that had accumulated on the wings. After covering a hundred miles or more, and making quite a number of abrupt turns, I found, to my surprise, that I was over a deep green valley, which I judged to be two thousand feet lower. I could see but very little on account of a heavy mist. I was flying then at the twenty-five hundred foot level and still unable to go up. Having gone over about sixty miles of this, I found myself locked in this valley until such a time as I could rid the plane of the ice with which it was covered, so I started to hunt for a landing place. Then I went under a dense mist, saw a lake, and hope rose within me.

"At the thousand-foot level I noticed a sudden pronounced rise in temperature and an odor that reminded me of the old chemical lab. at school. At five hundred feet I began to get light-headed and my mind began to slip. I tried to go up. I wanted to get out of that chemically infested region, but my power and will were gone. At two hundred feet I knew I was being overcome. Then praying and hoping for the best, I dove to a landing, shut off the power and collapsed just as I began to skid.

"Before I really became conscious of life again I had two flashes of thought, or rather semi-conscious delirious spells. My first impression was that I had died and was in purgatory or some such hot place, for physically I was going through all the tortures that could be prescribed for my sins. My entire body seemed to be afire. My eyes saw nothing but flames. I heard a few phrases or mumbled words spoken in a strange but understandable tongue. I felt I was fighting a dozen imps. Just then some one, whom I judged to be the devil himself, stabbed me in the back and I lost consciousness again.

"During my next spell all was changed. I still believed I was dead. But now I thought that one of the saints had come to my rescue and had brought me to Heaven. At least I seemed to see angels. I no longer suffered as I did before. All was quiet and serene. Again I heard that strange tongue, but this time I understood, for some one who seemed to know me said: 'Bud Layton is going to live; now everybody but Eros must leave; this injection will help him to rest, and when he awakens he will be truly well.' Once more I was stabbed, this time in my arm, with a hypodermic needle.

"Later, upon my real awakening to consciousness, I was probably as much surprised as you were when you received my message of a few days ago, for, as you will remember, my last conscious thoughts were upon the fight I was making to land safely and at the same time trying to get away from some gas which was overcoming me. Then again I knew I was, or had been, in an inhospitable frozen land somewhere near the South Pole and wondered what my dreams of Satan, the Saint and the angels had to do with my present situation.

"I still felt rather sore all over, but not really uncomfortable. Upon opening my eyes I was still more puzzled, for seated at the bedside was the most beautiful woman I ever saw. Noting that I had moved and before I could speak she placed a cool hand on my hot brow and said 'Mada says you are Bud Layton and you are to do nothing but rest.'

"That did nothing to clear up the situation; I was still inclined to believe I was dead, and I said, 'I don't know who Mada is, and I am willing to rest, but you are an angel and I would like to know where your wings are.'

Laughing, she replied rather mysteriously: "Oh, we never bring our wings into the house. I am Eros, daughter of Mada, who is King of Noen and the wisest man of our land."

BUD fell back exhausted once more. He tried to smoke a cigarette, the first in many years, but he could not. After resting a while he began again:

"Mada's instructions were to give you this blue spring water," Eros continued. She then placed her arm under my shoulder and helped me to sit up. After I

drank the water she gently eased me back on the pillow.

"Bud," she said, "in our land it is the custom for the maid to do the courting. I believe I have always loved you. I have waited for you all my life, for I should have been wed now for several years. I do not know how these things are arranged in your world, but should you return my love for you, you must declare yourself over the radio, telling all in our world of our love. I can see from your expression that this is all strange to you, but it is for you to say."

"Bring in the microphone," was my answer; "I want to tell all of the world that an angel loves me."

"Mada came in just as Eros kissed me. 'Ho! ho; So soon and all is settled! You didn't give Bud much of a chance, Eros. I think you will both be happy. But run along now; there are a few things I want to explain to your prospective husband.'"

"Mada was a white-bearded, kind-faced old man, whose age I never did learn. 'Bud,' he said, 'things have certainly moved fast for you during the past few hours; you have lost a world, come into a new one and gotten yourself a wife. I am glad to welcome you as our lifelong guest, for, while you still live on earth, you, too, will probably never leave our valley. For the present I am going to ask you to refrain from asking questions; for all that seems so mysterious to you now will eventually unfold itself and become simple. To begin with, I want you to listen to this radio for a few minutes.'"

"I did as he asked then, and I did so many times afterwards. Through it I learned of your search for me until the elements drove you out of Discovery Bay."

"Your ability to hear your friends," continued Mada, "will apprise you of how I happen to know who you are and why we know so much about your world. Unfortunately, however, we have been unable thus far to do more than to receive from the outer or your world. We cannot transmit beyond our valley. This is probably due to mineral or ore deposits contained in the mountains which surround us."

Bud now asked for one of his pills, drank a small portion of brandy and began again:

"We here," continued Mada, "are all that is left of the oldest civilization on earth, but to make you really comprehend what I say we will have to go back many ages, to the time known to your students as the Tertiary Period. At that time this part of the earth, at present known as the South Pole, was a continent covering many times its present area. Our climate then was very similar to that of Europe or North America of the present day. Our population at that time was greater than that of both of these countries combined. We had many cities larger than London and were a very prosperous people. Our sciences, aviation, radio, medicine and engineering were even at that age much further advanced than are those of the modern world. But the glacial age gradually crept over us; the entire world began to change; mountain ranges, such as the Alps, Caucasus, Himalayas and Rockies, were formed. New continents were made where before there had been only ice and seas. Our climate changed; the seas swept over us and the people fled, not knowing where to go. Some went in one direction; others went in other ways. Doubtless they eventually spread to the present-day continents as tribes; they lost their arts and sciences; they fought unknown monsters and fought among themselves until

they became mere savages. It so happened that during this upheaval, or near the end of that age, Mt. Noen and this valley were formed. Since then, to the best of our knowledge, no material physical changes have occurred on earth."

"Mt. Noen to our south and Repository Mountain to the north are each about ten thousand feet high and nearly sixty miles long. Along the entire base of these mountains are almost perpendicular cliffs; these are about a thousand feet high along Noen to the south and of various heights to the north. They enclose our valley, which is, on the average, three miles wide. To the east and west are more cliffs which gradually grow higher. These are lost at a turn."

"Mt. Noen is not only a mountain; it is an active, though not a grumbling, volcano, emitting now, as it has throughout these past eons of ages, a steady stream of gas over its thousand-foot cliffs. This gas contains what to you is a new element, noen, named after the mountain from which it comes."

"It is this element, noen, in our atmosphere which imprisoned the two thousand people who entered here so long ago. It is the same element that caused you to experience what you have just gone through and what will hold you here. I can appreciate that the idea of spending the rest of your life in a cliff-bound valley may not particularly appeal to you, for you have gone over such a wide expanse of the world and are used to going great lengths at your will; but regardless of your future desires you, having inhaled the air containing noen, are affected by it as are all animals or birds who enter our valley. The first action of noen is to produce a coma. This is fortunate, for the pain following could otherwise hardly be borne. It attacks the lungs, virtually changes their construction to accommodate them to itself. This in turn creates a transformation in the blood and, to a small extent, in the color of the skin."

"Noen, the element, comes or is poured into our valley at such a temperature that, despite our surrounding climatic conditions, it keeps our valley green and our atmosphere at a constant degree of temperature. However, its life-giving properties deteriorate as it cools, and in the course of three hours are entirely dissipated. Let me mention also, while we are on the subject, that noen cannot be stored or compressed for future use or we would have visited you in your lands long ago."

"For many years it has been my ambition to make just such a trip as I have suggested, and I hope some day, though perhaps not in the very near future, to find an antidote for noen which when taken regularly will enable us to breathe through to the atmosphere of the outer world."

"This language I use is strange to you; yet you know it. It will take some time before you will be able to think with it, but when such a time does come a thought expressed in any tongue, whether it be Sanskrit, Latin, Greek, Hebrew or English, will not impress you as strange, for ours is the basic language of the world."

"I have also been very much interested in the modern religious teachings of your world. I have seen the copy of the Bible you carry in your plane; it is the most valuable book in our land today. And as you are not going to do much flying for some time to come and are going to be with us a long time I hope often to hear from you as the Reverend Bud Layton, the clergyman whose work in our valley will be Theology!"

By this time Bud was so weary that he had to lie down. While he was at rest, as you can imagine, we talked of nothing but him and his thus far related experiences.

AFTER he had rested Bud continued: "The longer and better one knew Mada the more one loved him. No subject or study was too profound for him; his absolute knowledge seemed limitless. He was a great teacher and he was a good listener. Usually he could be found in his study, and it was here that we spent many happy hours together. His study seems to me to be almost beyond description. Among other things it contained machinery of all kinds—some pieces just started—others finished, the use of which I never did learn. One corner was devoted to chemistry. Here were more retorts, vials and bottles of different shapes and sizes than I believed existed. Another space was used as a library, while along one of the walls was a desk fifty or more feet long which was literally covered with all kinds of plans and formulas. He moved from one subject to another for hours at a time, absolutely silent, making a change here and there, always with precision and confidence.

"During his recreation periods he usually sipped a glass of a light wine. At one of these times he turned to me and said: 'I am now working on the most important experiment we have ever attempted in our land. Our present results of this experiment have been secured through trials made by my predecessors in former ages. I am making great strides toward its success. Our object is and has been to find the antidote I mentioned some time ago for noen gas, and I have had the advantage or knowledge of knowing what chemicals and what processes of compounding have been tried before; besides your coming here with an adequate transport vessel for us has spurred me on. *Llip* is what it will be named, but how soon it will be made just right is still a matter of conjecture. Now as to your plane. We must take care of that in such a manner that it will always be ready for use, and for that reason I am having an air-drome built up on top of Repository Cliff for its storage. I know you have a generous supply of fuel. I am therefore going to ask you to store away, in receptacles that will be provided, what you estimate will be a quantity great enough to take us to where you know more can be procured. This we will never use until such a time when as we know that *Llip* is perfect. The rest of the fuel can be used for trial trips when we deem it necessary to make them.'"

"At another of our meetings he said: 'Bud, you have learned a little of our past history. As to the present, you are living in it, but what I am about to reveal to you of the future must forever remain an absolute secret, for were this information to become known to our people in general it would do nothing but stir up discontent without changing the inevitable. We started with a population of two thousand; now again we number that many. I know we are a dying race and have about outlived our usefulness. Fewer children have been born with each succeeding year, and now none have been brought into our world since Eros was born. My knowledge, however, goes further than that, for I have personally examined, at one time or another, every living person in this valley, including yourself (I examined you while you were in the coma resulting from your

coming here), and my findings have taught me that only you, Eros and I will be alive a score and ten years more.

"When only we three are left," continued Mada, "this valley, our country, will be destroyed," he ended.

"It might be well now," continued Bud, "to tell you that the people of the valley lived to a great extent as one family. Nothing had a monetary value. In this community, as in all other communities of the world, some people do one thing or kind of work better than they can do others. In Noen the folks seemed to drift into their natural vocations. There were farmers who saw to the raising of cereals; others attended to the growing of fruits and the making of wines, while another number supplied the vegetables. There were cooks, machinists, miners, textile workers and those interested in the sciences—all adapted to the work they were doing—happy and contented, for they worked for the mere joy of accomplishment.

Meals were served twice a day, and everybody who could attended to them. Outside of their meals each family enjoyed absolute privacy in homes that compare favorably with our modern palaces, but on a smaller scale. These homes were clustered about the center of the city, also named Noen.

IT was Eros who first guided me and explained most of what I learned about the city, Noen. 'We of the present,' she said, 'have very little or no use for builders on account of the depopulation of our land. Many ages ago the extreme westerly end of the valley was laid out for our city. This was built by the priests, who were competent engineers. This was done much in accordance with the religion of that time, which was based upon astronomy. The city covers an area about three miles in diameter, and as you may guess, was surrounded for the most part with cliffs. The land was almost as flat as a table, with a natural drainage to the west.

"The Sun Temple, exactly in the center of this area, was the center about which the city was built. This was erected on a circular piece of ground a thousand feet in diameter. From this circle all avenues radiated to the outer boundaries of the city. Those going in the direction of the cardinal points of the compass were two hundred feet wide. Other avenues of one hundred and fifty feet were laid in the direction of the loxodromic lines of the mariner's compass. These avenues were then intersected with great wide streets—true circles—about a seventh of a mile apart."

"The materials used in the making of these roads, on which I never saw a wheeled vehicle, were bricks made of a silica compound. Similar bricks were used as building materials. These, however, were fabricated in different sizes and shapes and made either transparent or opaque and colored for their particular purpose.

"The Sun Temple was a magnificent, massive structure, the base of which contained an arena built much along the lines of our modern football stadiums, with the exception that it was round and the seats at the floor level surrounded a platform fifty feet across.

"On the outside of this base, which was one hundred feet high and three hundred feet through, were four grand stairways. These were as wide as the avenues from which they led. At the top of each of these stairs were enormous doors, each of which was a masterpiece—real works of art. Then between these doors, facing

each of the other avenues, were glorious stained glass windows which told in detail the history of the continent before the beginning of Noen Valley itself.

"Over the entire base or arena of this building was a great dome, a perfect half sphere of golden semi-transparent brick, through which the light of day seeped, casting its glow upon all that was within. The building of this dome was in itself a work of engineering never since duplicated. This was supposed to have been accomplished by filling in all of the space under it with earth. When the desired form had been attained it was allowed to settle for years. The bricks were then carefully laid over this bed, and when this was completed the earth under the dome was excavated.

"In the center, beneath the dome, was a model thirty feet across the temple itself, with a great glass ball over the base, instead of the dome. This ball was made of golden glass, inside of which were hundreds of electric bulbs. When these were illuminated it was truly a competitor of the sun, which it represented, to those who when the temple was built were sun worshippers.

"There were four more large buildings, one at the outer end of each of the wider avenues. To the south there were two, for at the base of the cliff was the Government Hall, in which were housed Mada's offices, studio and home. Immediately over this, about two thousand feet above the level of the city, stood Repository Hall. This building, probably the greatest structure in size in the valley, was built in the shape of a crescent and was of silver brick, resembling the moon. It stood on a level area about one-quarter of a mile square, which was twice as high as the noen gas belt, but was supplied with that element pumped up from the valley. This enormous building did not belie its name, for in it, in addition to the priceless histories of the continent before the present era and the history of Noen itself, were copies of every formula, models and plans, with specifications of all machinery used in the land; also samples and information concerning chemicals, minerals and ores. These had been gathered, catalogued and placed here with painstaking care for the enlightenment of posterity. Mada, as well as the other former leaders of Noen valley, expected at some time that these treasures would be discovered by some one of the modern world.

"From Repository cliff, from which all of the city and most of the valley could be seen on a clear day, the building to the north, another of silver brick, looked like an enormous six-sided star which had partially been buried in the side of the cliffs at Mt. Noen. This was a mausoleum, ages old, as were the structures I have already spoken of. Enclosed in it was another jewel-like building—the crematory—which contained funeral rooms where I officiated, and the ovens for cremation.

"The ovens were built—walls, sides, top and bottom—of a perforated, ever-bright metal called revis. The bodies of those from whom their souls had departed were laid in restful-like positions on cots and placed in the ovens. The front, a heat-proof door, was then closed and noen gas, piped through the cliff and superheated by electricity, was introduced. The actual consumption of the body was then only a matter of a few hours. Later, when the ashes had become cooled, they were placed in urns and set in one of the niches and sealed in with a stone, on which a plaque was placed.

These niches rose tier after tier to a height of over a hundred feet. In this building also a history of that remarkable land could have been gathered through the reading of the inscriptions on the plaques.

"To the east another monument of silver brick had been erected which, in form, resembled a mason's trowel, and in which were six swimming pools. These pools were fed with natural colored waters piped directly from the various colored springs found in different parts of the valley and on the mountain sides. Each of these springs had certain medicinal values, and all had health-giving qualities. The natatorium also contained a number of other rooms for recreation, among them being lecture and radio studios, where news from all over the world was not only received but recorded and filed away for future reference.

"The main building to the west was a tower-like structure, built to represent a comet. At the base it was about fifty feet square to a height of nearly a hundred feet, from which point it spread up and out and seemed to lie on the side of a sloping cliff. It was an odd-looking building, for there were no windows in it, although it rose to a height of more than two hundred feet. This building housed the city's water supply and was at the same time the city's sanitary plant. This may seem rather paradoxical, but, about a hundred and fifty feet above the city level enclosed within this building, was a seam in the cliff through which an underground stream of considerable volume found an exit. This pure water was at this point received in a tank, built by the engineers of many years ago, and from it the water was piped to the places where it was to be used. However, the flow of this stream was great enough so that, in addition to giving the city a plentiful supply of water in times of its greatest need, it poured over the edge of the tank a steady torrent ten feet thick, which fell on the face of the cliff within the tower or comet-like building and disappeared into an immeasurable pit. Into this pit the sewerage of the city was conducted, to be carried away with its odors by the fall of the water.

"For the disposal of garbage and other refuse, a cubic tank, about twenty feet in each dimension, was built of a steel-like metal, the back wall of which consisted of a pair of sliding doors which could be opened toward the pit. After the waste had been placed in this tank and the front door was closed, the back doors were opened and the roof of the tank was drawn under the fall of the water on tracks provided for it, diverting the course of the stream into the tank in such a manner that it not only carried away the contents which had been placed in it, but also washed it clean. This was done as often as it was found to be necessary.

"There were many more important buildings, particularly the iceless cold storage plant, a necessary economic factor. In this plant at all times was stored enough perishable food to supply the entire current population for a period of two years. This was done at Mada's command, for he knew there would, at some future date, be no workers in the fields to supply those who still survived.

"But before I forget," said Bud, "I want you to provide me with a sheet of ruled paper and a pencil. I want to write the alphabet and the Lord's Prayer in the characters used by the inhabitants of Noen valley. I don't know that it will prove of much value to you, of the world of today, for the reason that any individual char-

acter written either above or below the line has an entirely different meaning, much the same as different inflections of the voice have when the language is spoken. I want to leave this copy with you, anyway, for your own satisfaction. I will also write over each character, as near as I can, a translation in English."

THE effort Bud made writing what he did exhausted him to such an extent that we were afraid he had done too much, but a long quiet sleep helped wonderfully.

He seemed to be obsessed with the fear that he might pass away before he completed his story. Immediately upon waking he continued where he had left off. "During one of the many visits I made, Mada suggested it was time for a little recreation. He proposed that I tune in and see if I couldn't find some one who is talking on one of the sciences. The moment was an opportune one, for I happened to get Schenectady, N. Y. at the opening of a lecture entitled, 'Electric Generators and How They Were Built and Operated.' Mada remarked at the conclusion that it was a very good method, but too expensive, because it required much attention and many replacements."

Pal, being quite an expert, could not help asking at this time what method of making electricity was used by those in Noen. "Well!" said Bud, "I will explain that to the best of my ability by trying to repeat, as near as I can, Mada's answer when I asked the same question." "Our method of generating electricity," said Mada, "is entirely different from yours, for our prison keeper, the element noen, does the work for us, continuously. once we lead it to the task."

"The generators are built in this manner: We begin by making a coil of two inch square bars of two kinds of metal, known as revilis and mula. This coil, when completed, is ten feet across and thirty feet high. The bars are wound in parallel and spaced one inch apart. This spacing is filled in with the same silica compound used in the manufacture of brick, making the completed coil a tank which is mounted upon an insulated base. The finished tank is then filled with a pulverized mixture of magnetite, a magnetic mineral, and uranium, a comparatively rare metal which is radio-active. Into the center of this mixture, eight feet from the bottom of the tank, a bar of nori six inches in diameter and thirty feet long is placed. This is held in position by the mixture and by supporting insulated materials. The upper ends of the coil of revilis and the bar of nori are connected; the lower end of the mula coil is grounded. The next procedure is to introduce into the mixture contained in the tank a stream of noen gas through an insulated pipe. The gas for this purpose is drawn from a hole tapped through the cliff. The gas so obtained has a temperature of nearly six hundred degrees and this gas in combination with the mixture in the tank, and the heat that comes with the gas, generates the electricity, which is received by the tank-like coil."

"Our next problem then is to handle the current produced. Tapping the coil proved unsuccessful. So another coil twelve feet in diameter and forty feet high was built of a one-inch round bar of reppoc. This was placed around the generating tank and receives the current produced by induction. This electricity is then sent to transforming stations from which it is transmitted, at required frequencies, by wireless, for all pur-

poses. The power, however, fails to carry more than a thousand feet beyond the noen gas belt."

"In connection with this transmitted power," said Bud, "I don't suppose that anything I saw in the valley aroused more interest in me than the statement Eros made that the folks did not bring their wings indoors, and later to learn that the angels, I believed had been about me during my delirium, were human and could fly."

"During my life in the valley, everybody had at least two pairs of wings . . . one pair for fast flying, used for personal transportation, and another pair for the moving of freight. These wings were patterned after those of a bat. The power plant, or receiving coils, which operated the wings were built much along the lines of the generators I have just told you about, and the wings were placed on the back between the shoulders, similar to the scapula. The frame, or bones of the wings, namely the clavicle, humerus, radius, carpal, metacarpals and sternum, all hollow tubes, were made of a metal resembling aluminum in appearance but with the strength of steel. These were connected together in bone-like sockets and lubricated automatically. These tubes also contained the wires which carried the power to actuate the magnets that operated the muscles and ligaments. The muscles were a series of coil springs enclosed within the ligaments, built on the lines of sleeve valves. The entire wings were covered with a pliable water-proofed material of great strength, painted to resemble feathers."

"The body or carrying envelope resembled a diving suit, the helmet of which was perforated. When the wings were discarded, they rested on the ground and were supported upon what might be considered a stiff vertebra and two collapsible tubes, which extended from the sternums."

"To adjust the wings for flight, one stepped back as if to get into an overcoat, then pressed a button in the chest-like compartment, which contained the controls. This action would cause a number of flat metal strips similar to ribs, attached to the backbone and built into the envelope to encircle and clasp the body in such a fashion, that while one was in flight no more discomfort was experienced than when one laid down to rest. As to speed, one could fly from one end of the valley to the other and return within an hour. I also want to mention that the wings were fool-proof, for, although the speed and landings were under easy control, they were built so that if any part of the machinery failed or wrong controls were used, the wings no longer under control would act as a parachute and the flyer would settle to the ground."

"FOR the next moment or two I again want to refer to Mada and his experiments in his attempts to perfect *Llip*. Every few years, as we eventually grew older, he would seem to boil over with enthusiasm and for a time claim that he had solved the problem. To learn the effect of his prescriptions, he would treat a number of geese with his medicine, put them in a cage of a captive balloon and allow it to rise over the noen gas belt for different intervals of time. When the balloon returned and the birds were found dead, he would begin all over again, but he claimed at the end of each experiment that he was coming nearer to making the medicine right, for his autopsies proved his progress."

Finally, but only about three weeks ago, he sent a basket of birds aloft for four hours and they came back alive.

"Ten days ago Mada, Eros and I, all that were left of the inhabitants of the valley moved to Repository Cliff, for we found we could live without ill-effects and without noen gas as long as we took *Llip* every four hours. Just try to place yourselves in our position; we could breathe without the element noen and could leave when we got ready. Unfortunately, the secret for making this antidote was not discovered until it was too late to do much good.

"However, we were overjoyed, regardless of the past. Imbued with hopes that were never to be realized, we loaded up my old plane, made a couple of short trial trips and began packing our things to get ready to leave. This had not been completed before Eros passed away in my arms, once again verifying Mada's prediction of years ago. But I must hurry. I want to tell you of all I have seen and learned, and I feel the end is near. I had hardly completed my prayer for Eros, preparatory to closing the door of the oven, when Mada passed away. Then, being absolutely alone in the world, as far as I had known it for nearly a third of a century, I did the best I could for Mada . . . what he and I had just done for Eros.

"From that time on until I awoke here aboard the *Investigator*, I have been more or less in a daze, but I do remember, that after closing the doors of the ovens at the crematory for Eros and Mada, I rushed about trying to do all I could to move the records that were still in the late Mada's office to Repository Hall; I also remember that while I worked I accomplished nothing, for I never completed anything I attempted.

"All during the time that I lived alone in the valley I was afraid to stay, but I did not seem able to leave because there was so much that needed to be done. Mt. Noen began to grumble; seams at different places in the base of the cliff opened and fire issued from them; still, I lingered, until I found that the generators which created the power with which my wings worked no longer functioned. This shocked me so that it brought my mind back to normalcy and I realized that if I did not hurry I would never leave the valley alive. To get away I had to get up on Repository Cliff and board my plane. To get there I had to walk four miles. I am no longer as young as I used to be, and after what seemed to me to have been ages of heart-straining struggle, I reached a point two miles to the west of the valley and up about four thousand feet. While I sat there, trying to recover my breath, all hell seemed to have broken loose; the mountains all about me shook and trembled; the earth beneath me began to slide. I was thrown down, but I did not move very far or sustain any serious injury, and all I could do in my fear and terror was to look over the valley with the aid of my binoculars. As I watched, absolutely entranced with the grandeur and the enormity of the destruction, I saw the entire cliff of Mt. Noen gradually lean over the valley. I wanted to see it fall, and yet in my heart I wanted to hold it back. In the meantime, more and more streams of fire shot out from the seams as they opened until with a roar, which must have reached the furthest corners of the earth, the cliff toppled over and fell crushing, burning, burying and destroying all that lay before it. Enraptured, and still unable to move, I had wit-

nessed only the beginning of the catastrophe, for Mt. Noen split again with another roar just opposite Repository Cliff, and here the only error that Mada ever made revealed itself, for through this cleft or opening, a stream of water thirty feet in diameter shot forth from an unknown underground lake. In action, this water resembled a hydraulic stream, for it washed away all before it. The Sun Temple disappeared as if it had been built of sugar, and then, to my horror, the hopes of my life and the labors of the Noenites began to crumble, for as I continued to look, Repository Cliff, Repository Hall with its records and my plane tumbled over into the turmoil.

"How long the resulting incessant roar continued I have no means of knowing, for something struck me in the head and knocked me unconscious, but undoubtedly the water flowing from this underground lake entered into the natural rents and those that had been tapped in Mt. Noen's side. When this water and the fires, which for so many eons had supplied the valley with its heat and made its gases, came together, steam with millions of tons of pressure was created until, under the strain the mountain itself burst asunder and fell into the valley, covering it completely, hundreds of feet deep, for when I once more regained consciousness, only a part of Mt. Noen was there; Noen Valley was no more, and a lake, possibly a mile wide covered the valley. You will be able to locate this body of water because it is just over the mountain you did not cross when you were searching for me so long ago; also the new scars on Mt. Noen's side will aid you.

"It was some time after I realized that I was not dead and understood that I had neither home nor country; then I began my attempt to reach civilization. I will admit I did not have much courage, but I did hope I could reach my radio experimental station and then get far enough away from Mt. Noen to call for and get assistance, and my presence here with you tells you of the success of my attempt.

"What I have told you, so far, hardly makes a scratch on what would be a detailed account of what I want to tell you relative to the arts, sciences and manufactures that would be of interest, but boys, my supply of *Llip* is gone; I have come to the end of my rope and I am soon going to begin the eternal sleep. I know that after I am gone my buddies of old will want to see the valley into which I disappeared. When you go, take me with you and leave what remains of me there."

Bud's going was a peaceful one. Two days later Cap. Pal and I took him in our plane back to where Noen Valley had been. Here we found conditions much as Bud had told us, with the exception that the lake was frozen. We taxied down on this sheet of ice to a spot over which we judged the crematory had been. Here we dug a hole through the ice and gently slid Bud wrapped in a weighted shroud to sink so his body would rest as near as possible to the ashes of his beloved Eros and Mada.

After a prayer for him, we scouted around the edge of what we named Noen Lake, but found no signs of the civilization in which Bud had lived so long.

Upon our return to the *Investigator*, I gave orders to leave Discovery Bay, and sent a report of the cause of the reported disturbance to the Geographic Societies, as told to us by Bud.

Time Hoaxers

By Paul Bolton

(Continued from page 435)

"Jason," she said, "while our men were busily engaged in studying the principles of our time flyer, they forgot one thing which I remembered.

"Our wisest men argued against ever attempting the trip, even were it possible. They pointed out that the motives in taking this step backward in time—to carry to our forefathers a few of the secrets we had wrung from nature—was in effect an effort to change the course of time. They were, of course, correct, since time and progress cannot be artificially hastened.

"But I reasoned that, if such a trip actually were successful, there must have been some records kept of it. We have no newspapers in our day, as you know newspapers, but in our museums were files, going back many generations.

"For weeks I pored over them. Finally I hit upon an article describing the love of a young college student and a girl named Anis, who claimed to be from another century."

Anis paused, blushed, and then went on a bit breathlessly:

"Jason, had it not been for you, this trip probably would never have been made. For I found the record of the tribulations we were to suffer, the ridicule to which we would be put, the harrowing escape from spending our lives in a prison. But I also found my lover. So I did not tell my colleagues of my discoveries."

Then she showed me the clippings, which I enclose. You may claim the yellowness and brittleness of these papers do not prove their age. That may be so.

Yet there is one to which I call your attention particu-

larly; because this clipping convinced me of the truth of Anis' claims.

It is a *World News* dispatch, dated the day after this letter is written.

It tells of the disappearance of the Time Hoaxers and Jason Copeland. It tells of that disappearance in detail.

It was printed in a great metropolitan daily, which was not published until hours after the events described.

Yet, while I write this, none of those things has even been dreamed of by any persons except Anis and myself.

I am so certain that every detail of this story coincides with the story the *World News* reporter will write tomorrow that I am risking my life and future on that certainty.

(The clipping started: AUSTIN, Tex., Aug. 30—(WN)—In a sensational escape, etc. It coincided in every word with the last dispatch in this series.)

It matters little to me whether the story of the time travelers be accepted. I have renounced all possessions of this day for another; but these faded yellow clippings, from century old, yet unprinted, newspapers, may inspire some scientist to higher research, or may pave the way for the next time travelers.

Or, perhaps, they may only inspire some writer of imaginative fiction to still greater efforts in the realm of the speculative, or open to some reader as yet undreamed of vistas. In any event, they will not be entirely lost, nor will this letter, in which I bid you all goodbye, be without effect.

Jason Copeland.

THE END.

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. Can you give some examples of the number of atoms in a cubic millimeter of hydrogen? (See page 390.)
2. Is there any space between the constituent atoms of any substance? (See page 390.)
3. What is the present conception of the constitution of the atom, and its electrons and protons? (See page 390.)
4. Is it conceivable that matter could be condensed to a high specific gravity? (See page 392.)
5. What is a shadow of an object, and what are its dimensions? (See page 404.)
6. How is glass annealed? (See page 404.)
7. What are the melting points of platinum, tantalum and tungsten in centigrade degrees? (See page 406.)
8. What angle is subtended by the moon? (See page 411.)
9. What possibility is there of a thermo-couple power plant upon the earth? (See page 414.)
10. In a war in outer space would the detonation of the bombs be heard? (See page 417.)
11. If your speed increased by a given number of units each second, how would you express it in full? (See page 425.)
12. How could a place such as a walled city be so protected that no metallic object could enter it without detection? (See page 460.)
13. What is a micron? (See page 462.)
14. Can you give a theory of a germ disease? (See page 467.)
15. How are curative serums prepared? (See page 467.)
16. What distinction could be drawn between a vaccine and an anti-toxin? (See page 467.)

The Burning Swamp

By Morrison Colladay

WHAT are meteors? Where do they come from? It may be many years—or it may be many generations—before these questions are satisfactorily answered by science. Those meteorites which were found in various parts of the world have shed very little light on the subject. But if, as some scientists aver, meteors are missiles from other planets or suns sometimes peopled with other intelligences, then interesting things, indeed, might be discovered in the future. What kind of intelligences would they contain? And their purposes in being directed toward the earth might be many. Vast fields for speculative thinking—and writing. This story, we believe, is a good sample. We hope we will get more.

Illustrated by MOREY

DOWN in Arkansas, a few miles below Memphis, on the opposite side of the Mississippi, a forest fire has been burning for the past six weeks. There are some remarkable things about this particular forest fire. It spreads over an area twenty miles across, and it does not burn out. The Memphis newspapers say that the swamp which occupied the spot had a bed of peat underlying it. Only two other men besides myself, know that is not so.

Jim and I are fourth year engineering students. A few weeks ago, when vacation began, we decided to spend the summer floating down the Mississippi in a shanty-boat. Of course, the first thing we had to do was to get the boat.

We went to Pittsburgh and began scouting along the river banks below the city. We had not much money, so it was not a question of getting the kind of boat we wanted, but of finding one we could pay for. In the end we were lucky. We both think that the owner of the "Cockatoo" was just one jump ahead of the police, when he sold us the boat. He looked like a bootlegger or worse, and he surely was in a hurry to get the transaction completed.

When a couple of storekeepers in the neighborhood, where the boat was tied up, assured us that he actually owned it, we took a chance and gave him the money. He stepped off and we stepped on. We never saw him

again, and we don't know whether we helped him cheat the law or not.

We started off down the river, rejoicing. We had a boat powered by an old marine engine, which sometimes runs, and that was rather more than we had hoped for.

The voyage down the Ohio and the Mississippi has nothing to do with this story, and I suppose it has often been described. We used to tie up to the bank at night so we could both sleep. Sometimes we would tie up near other boats, and sometimes there would be nobody within miles of us. After we had cooked and eaten our dinner, we would sit on deck, smoking our pipes until the mosquitoes drove us in.

Jim and I are the good friends we are, probably because each of us is so different from the other. Neither of us could help being interested in a person having such crazy ideas as we each think the other has. I am practical. I have the scientific mind, but I have not enough imagination to become a great scientist. I shall always be a plodder . . . Jini is a romanticist and he has an imagination, which he likes to let run away with him.

We brought a few books along with us, and one of Jim's was a curious volume called "The Book of the Damned," written by a man named Charles Fort. It is hopeless to give more than a faint idea of the extraordinary nature of the book. The author believes that, floating around between the planets, are "islands" in-



What we expected to see, when we reached its top, was the hole which the meteor had made and from which it had forced the earth. What was spread before, was quite beyond our wildest dreams.

habited by intelligent beings. Some time the bottom will fall out of a lake on one of these islands, and there will be a rain of fish or frogs on earth. Some time there will be a battle in the air, followed by a rain of blood.

Expressed baldly this way, it seems merely silly, but Mr. Fort has gathered together descriptions of an immense number of contemporary accounts of phenomena, which make even an unimaginative person like me a little uncomfortable. Jim became an immediate convert to the belief that there were strange beings in the universe, not so far distant from us, who occasionally visited the earth in secret.

"I should think you'd want to believe it," he said to me a little impatiently, one night when we were talking more seriously than usual. We were tied up under a steep bluff below Hannibal.

I laughed. "I know what you mean. It makes life more exciting and interesting if it's so."

"Well, maybe," he reflected, "but still that's a good enough reason, isn't it?"

I REMEMBER the conversation so distinctly because it was on this night that the first great meteors appeared, at least the first that was reported. There are always occasional meteors which flash across the sky, particularly in August and October. Sometimes they explode with considerable noise. But never before had there been one which shook the earth like an earthquake.

I had better tell exactly what we saw. I was sitting there idly watching the eastern sky, and thinking over Jim's last remark. I was finding life sufficiently interesting and exciting without interplanetary visitors. . . I think we both noticed the glare in the east at the same time.

Everything happened so quickly, that we had to put together our impressions after it was over. The glare

increased almost as fast as a flash of lightning, and then we saw the ball of fire flying through the sky overhead, leaving a long trail of fire behind it. It appeared in the glare in the east and disappeared in the west.

The glare was almost unbearably strong until a few seconds after the meteor disappeared, but still the meteor itself was so much brighter, that it was possible to watch its course—except that it nearly blinded us to do so.

The earthquake began a second or two before the meteor appeared. It gradually increased in violence, and then dwindled away as the glare disappeared. When the meteor was directly overhead, our boat was tossed around as if it were in a hurricane.

We looked at each other in startled silence when it was over. A minute before Jim had been quoting instances from Fort's book, of supposed meteors, which the author declared to be "constructions" from interplanetary space, bearing living beings.

"What do you think of that?" he now asked quietly. "It was a big meteor," I replied, "but I don't see why we should think it was anything else."

We found from the newspaper accounts the next day that it had passed over most of the southern states in a northwesterly direction. Very little was said of the accompanying earthquake.

I think Jim and I did not discuss the subject again until a week later. We had tied up at Memphis that morning to get our mail. We hunted up a newsstand and got a bunch of New York papers. Late that afternoon we were floating down the river with me steering. Jim was sitting on deck reading the papers, when I heard a sudden exclamation from him.

"What is it," I called.

He handed me the Times he had been reading, and took the wheel while I read the article. Afterward I cut it out of the paper. It was an account of the voyage of the Cunarder "Franconia" from Liverpool to New York, and of a storm encountered on the voyage. I think I had better quote part of it:

"First Officer R. T. A. Ormsby, in charge of the middle watch from midnight to four A. M. Friday, said that after the terrible clap of thunder, he heard a rushing noise ahead of the ship, as if some huge body was hurtling through the air toward the ship. There was a big explosion about a hundred yards ahead, followed by a hissing sound as if a meteorite had gone into the sea. Mr. Ormsby said, 'and for three minutes the glare around us was so intense that we were blinded. The ship trembled with the force of the explosion and many of the passengers were awakened by it.'"

That night we saw our second meteor. It was about eleven o'clock and we were still sitting on deck talking, when Jim, who was facing the east, exclaimed, "Look! Look!"

I jumped up and saw the same spreading glare in the sky that we had noticed before the other meteor appeared. Exactly the same things happened this time. The glare spread like a lightning flash and then the meteor itself, a great flaming ball with a streaming tail, streaked across the sky. Again the earth rocked and we had to hang on to the cabin to keep from being thrown to the deck as the boat was tossed around like a chip.

In a few seconds it was over and the waves began

to subside as the glare faded from the sky. We looked at each other silently in the ghostly moonlight, now seeming paler than ever.

"I bet that one landed near here somewhere," said Jim. "What do you suppose the earthquake did to Memphis?"

We soon found out. Only a few minutes later we saw a faint glow in the northern sky, the first reflection from the fire which destroyed half the city. Soon we could see the flames.

"Let's go and see what's happening," I said.

There was not much we could do, when we arrived opposite the city, a couple of hours later. We landed and wandered around, inspecting the damage done by the earthquake, but we had to go back to our boat as soon as the militia arrived. Curiously enough, though the papers the next morning gave full accounts of the disastrous fire, none of them mentioned the earthquake which was its cause, or the meteor which caused the earthquake.

We talked to a few of the river men, and their impressions of what happened agreed with ours.

"Funny! I don't understand it," I said.

"It's plain enough that the authorities are keeping the meteor business quiet," declared Jim.

"But why should they?"

"Ask me something easier. I guess lots of things happen that we never hear about."

"Well, I'm blessed if I can think what there is about a couple of meteors falling, even if they're big ones, to keep them out of the papers."

We continued down the river that day, and at night tied up to the levee on the Arkansas side near several other shanty-boats. It was getting dark and knowing the river inhabitants as well as we did now, we saw there was something unusual exciting the crowd gathered on the levee, and gazing westward over the swamp.

"What's the matter?" I asked an old man who looked more intelligent than the rest.

He pointed across the sparse pine woods to where a pale glow appeared against the darkening sky.

"What is it?" I asked. "A house on fire?"

He looked at me condescendingly. "Yer as bad as the rest of these damned fools. It's that thar shootin' star that fell last night. I seen it comin' and I seen it land out thar in the swamp."

We both stared at him. "What makes you think it fell there?" asked Jim.

"Ain't I telling you I seen it land?"

"What happened when it landed?" I asked.

"Looked like a hull doggone town was afire, only there ain't nothing out in that thar swamp to burn that-away."

"How long did it last?"

"It's still lastin'," he said, pointing to the red glow which was getting brighter as the daylight faded.

"Any way of getting to it?" inquired Jim.

The old fellow looked us over. "Mought be," he conceded finally. "If y'all kin pole a boat, and ain't afear'd of snakes, you mought make it."

"How far is it?" I asked.

"'Bout ten mile, I reckon. Plum in the middle of the swamp."

"No dry land near?"

"Nary."

"Has anyone gone to see it?"

He laughed. "Them?" He jerked his thumb over his shoulder. "Pole a boat ten mile to see a shootin' star?"

Jim and I cast relieved glances at each other. "When it fell last night, did it make much noise?" I asked.

He scratched his head. "Well now, I jest plum didn't notice, with the hurricane and the yearthquake, and all."

We made our way slowly back to our boat. It was evident that we could not attempt a trip through the swamp at night. We owned a leaky dinghy which had come with our shanty-boat. We decided to try to pole it through the swamp in the morning.

We sat up later than usual on deck, watching the pulsating glow against the sky. "What do you suppose can be burning to throw off all that smoke for twenty-four hours?" I wondered.

"I don't believe it's smoke," said Jim. "I think it's steam. A meteor must be hot enough to vaporize all the water that comes into contact with it."

"I hadn't thought of that," I reflected. "I guess you're right. If it's still that hot, though, we haven't much chance to get near enough to see anything."

WE were up before daylight the next morning and pulled our leaky dinghy up over the levee and down into the swamp on the other side. We could still see the red glow of the meteor, but it was distinctly fainter this morning.

The old man who had talked to us the night before was up to see us off. He had told us his name was Ike and Gold and that he was seventy-five years old.

"I wist I wuz goin' along with you boys, but I'm too old, I reckon," he said regretfully.

"You might have to swim," suggested Jim. "This isn't much of a boat we've got."

"Plenty cottonmouths in thar," said Ike. "Don't pay no 'tention to 'em though, and they'll let you alone."

"I promise we'll let them alone," I said.

"Better cut you a couple of poles. Them oars ain't goin' to do you a mite of good."

"Think we'll have to pole all the way?" I asked, looking over the dreary expanse of straggling trees growing up out of stagnant water.

"Thar ain't nothing but this yer swampland for miles and miles back yonder. Y'all better not git lost."

We soon found that the trees were so close together it would have been impossible to use oars. Jim had set our course by his compass, and it was fortunate he did. By the time we were half a mile from the levee there was nothing to be seen but the surrounding swamp.

Poling the boat proved to be harder work than we expected. It was a different proposition from poling along a stream. We had to push our way around the roots of trees and through matted reeds and water plants. The mosquitoes were nearly intolerable and there was a little black fly that was worse than the mosquitoes. Occasionally we would disturb a moccasin lying with his mouth open. I imagined they looked at us malignantly with their wicked beady eyes, but they always swam quietly away.

Every half hour or so we would have to stop to bail the boat. Ten miles on this trip seemed like twenty or thirty.

It was about twelve o'clock when Jim turned around to me and said, "We must be getting close."

I looked ahead, but there was nothing to be seen except swamp and straggling trees. "What makes you think so? Looks to me just as it has all the morning."

"Put your hand in the water."

"Whew, it's hot!" I exclaimed.

We advanced cautiously from this point, though I do not know why we were cautious. Certainly at this time we had no idea that there was anything ahead of us to be afraid of. A few moments later we felt waves of heat beating down on us. Immediately in front there was a mound of freshly turned up earth about sixty feet high. As we approached nearer this mound the heat became almost unbearable.

"Funny looking pile of dirt," I remarked. "Looks like an excavation for a skyscraper."

"The meteor must be on the other side," said Jim. "I wonder if we can climb over, or had we better go around?"

"Looks pretty soft to me," I said as I leaned over and stuck the end of my pole in the ground. The pole burst into flames.

We gazed at each other in astonishment. "What do you suppose that means?" I asked.

"The only thing I can think of," said Jim after a moment's thought, "is that the meteor punched a hole in the earth and this ground was displaced when it landed."

We took our poles and started to skirt the curious looking pile. It did not take many minutes to convince us that it was roughly circular in shape and about two hundred yards in diameter. We stopped and sat down to decide what we should do next. The perspiration was pouring off us in streams. We had no thermometer, so there was no way of telling how high the temperature was, but we knew it was awfully hot. I poked around with the pole in the mound of earth. Neither of us had done much work in geology, so we could not even guess from how far below the surface it had come. It seemed almost like powder, it was so finely divided.

"One thing's sure," I said. "If the meteor's in the middle of this, we can't get to it."

"Not till it cools off, anyhow," agreed Jim.

"Even when it cools off, I imagine we'll find it's buried so deep that we won't be able to get at it."

"Well, I'm in favor of hanging around and having a try at it anyhow. It must be the biggest meteor that has ever been known."

"Suits me," I answered.

WE poled back to the river in less time than it took us to come out, but we were pretty tired when we caught sight of the levee. We found that we had struck it half a mile to far north, so we pulled the dinghy over to the river and floated down to our boat.

Old Ike was watching for us. "Find it?" he asked.

I guess we found it all right," I replied, "but we didn't see it."

"Buried in the mud, wuz it?"

We laughed. "Looks as if it had punched a hole halfway through the earth," I explained. Then I described what we had found.

"I'll be jiggered! Must be a big un."

"We think it's the biggest one ever discovered," said Jim. "We're going out again just as soon as the earth cools off enough for us to get near it."

While we waited, there was nothing for us to do

except listen to old Ike and fish for "cats." Ike had spent his whole life on the river, most of the time engaged in fairly disreputable occupations. He was quite proud of the fact that he had been what he called a "hellion," when he was younger. Certainly some of the things he told us were sufficiently hair-raising and were probably true. He may have exaggerated his exploits, but I do not believe he had enough imagination to invent them.

It is very easy to be lazy on a shanty-boat tied up against a lower Mississippi levee. However, on the third morning we pulled our dinghy over the levee and started on another trip to the meteor.

I felt the temperature of the water as we approached the circular mound and found it to be as cold as the rest of the swamp.

"Guess we'll be able to climb it this time," said Jim. We stuck our poles into the loose earth, and nothing happened. Then we bent over and gingerly placed our hands on the surface. It was warm but not uncomfortably so.

We tied the dinghy to a tree and began to climb on hands and knees. It was worse than climbing up a sand hill. The earth was like powdered pumice. We sank into it and every motion we made stirred it up in clouds which almost choked us. Our faces, hands and clothes were covered with it, and I imagine we were almost indistinguishable from the mound itself a minute after we began the climb.

That probably was the thing that saved us. When we reached the top and looked down into the crater, the creatures we saw did not see us. We did not realize at the time how dangerous they were, but we could tell from their appearance that they were unlikely to be friendly.

I am getting ahead of my story again. We crawled up that sixty foot mound of loose earth until we reached the top. Jim was a little ahead, and when he looked over the edge, he reached back and grabbed my arm. I guessed that he wanted me to be silent, though I could not imagine why. It was unlikely there was another human being within ten miles. However I could see that he was startled, and I crawled quietly up beside him.

Then I understood.

We had decided on our previous visit that the mound was circular and about two hundred yards in diameter. We had underestimated it, and it actually was nearer three hundred yards across. What we expected to see, when we reached its top, was the hole which the meteor had made and from which it had forced the earth which composed the mound. What was spread before our eyes, was quite beyond our wildest dreams.

We have learned so much about it since that I hardly know how much we saw at that first glance.

The great hole in the earth, over the edge of which we were looking, was like the entrance to an underground city. The sides were sheer, and in contrast to the loose earth we had crawled through were as hard as rock. Extending downward was a scaffolding of a bright metal unfamiliar to us, and a curious kind of elevators. On platforms at various heights were elaborate machines, the uses of which we could not even guess.

Crawling around over this scaffolding and working on the platforms were creatures so appallingly ugly,

that they were unpleasant to look at. They were almost six feet tall, and resembled overgrown roaches. Jim and I both think now that that is what they were.

I remember reading somewhere the speculations of a scientist about roaches. It seems they belong to an older order of life than almost any other creature that now survives. They are extraordinarily intelligent, and he suggested that if they were a little larger they would give man a strenuous battle for the mastery of the world. Well, here were roaches as large as man himself. Furthermore they had apparently progressed beyond man in the invention and control of machinery, judging by what was before us.

When Jim and I talked things over later we concluded that these creatures had been able to develop in some other part of the universe to their present size. They must have deliberately invaded the earth. The supposed meteors, we had seen, were really a kind of rocket bringing them from their former dwelling-place. What their object was we could only guess, but no one watching the ordered activity in that three hundred yard hole in the swamp could doubt that they had a definite object and would relentlessly carry it out.

That the creatures would be powerful enough to make them dangerous did not at this time occur to us. I mean dangerous to the human race. That they were dangerous to the two young men leaning over the edge of the crater watching them, we had little doubt even then.

After our first fascinated stare, we crawled slowly backward. We started to lower ourselves carefully down the slope, but a second later went sliding to the bottom in a cloud of choking dust. We landed a few feet away from where our boat was tied. Without saying a word we untied it and started away with as little noise as possible.

We put two miles between us and the mound before we paused. The perspiration was running down us in muddy streams. We were panting and exhausted. We had been so nearly choked with the dust in our noses and mouths, that we would have given almost anything for a drink of water, yet we were wise enough not to drink the swamp water.

We sat down and looked at each other. "Well?" I asked.

"Back to the boat first," replied Jim, "and then we'll have to decide what we're going to do."

When we had at last got back to our shanty-boat and talked things over, we had not a much better idea of what to do, than when we rolled down the outer slope of the mound. We could go back to Memphis and tell the story to the newspapers. If we did that, we would be laughed at. There was not a chance in a thousand of anyone believing us. We might persuade one of the newspapers to investigate our story. To do that, however, would take time.

On the other hand, we might investigate further ourselves, and possibly get some tangible proof of our story, which would make even a newspaper editor lose his natural scepticism. We had a shotgun and two Colt automatics on board, since everyone had told us that a trip down the Mississippi was not safe for anyone unarmed. Our boat was better than most of those on the river, and the river pirates are thicker than the rats. So far we had had no occasion to use our guns, but several times we had worn them as belt ornaments with good effect.

Now, however, we had an uncomfortable feeling that our weapons would not be very effective against the roach creatures. They looked as if a bullet could go right through them without hurting them much. Besides, we had every reason to suppose that there were several hundred of them in the meteor hole.

After talking things over, we decided to go to Memphis, and see if we could get some tear gas bombs. We knew that most large city police departments now use them. Perhaps we could find some place to buy them, or even something more lethal.

The next morning, soon after sunrise, we untied our boat and started across the river to a village called Laurel, where we took the train. After we reached the city we found it was easy to get the bombs. An inquiry of a loquacious police officer led to an introduction to the manager of the chemical company manufacturing them. There was not even a city ordinance preventing the company from selling to anyone who cared to buy.

We started back to Laurel on the afternoon train with the bombs and more ammunition for our pistols. We did not reach the levee until after dark, but old Ike was waiting for us. He had made up his mind that he would go with us the next day, in spite of his rheumatism.

"I suppose the trip in the boat would be all right," I said doubtfully, "but you couldn't possibly climb that sixty-foot mound."

"Mebbe not, mebbe not, but I kin stay in the boat, and if any of them critters chases you boys, I ain't never forgot how to shoot."

"It's going to be a darn dangerous trip, like," said Jim. "We're taking all sorts of chances going back there again."

Ike looked at us with determination in his old eye. "Looky here, boys. I'm agoin' if I have to go by my lone self. I ain't ever missed a fight yet, and I don't reckon to miss one now."

"If you feel that way about it, there isn't anything to say," I answered. "You're a mighty good sport and we'll be glad to have you along."

WE started the next morning just as the sky became light enough for us to pick our way through the trees. None of us felt in the mood for talking, and we poled silently until we came within sight of the mound. We left Ike in the boat, and began the slow and disagreeable climb. As I look back now it is hard to understand how we could have been so reckless. I suppose if the creatures had looked more like human beings, we would not have underrated their intelligence.

We were lying on the edge of the crater looking at the teeming activity below us when we were captured. I was conscious that a net of some kind had been thrown over me. When I tried to get up I tangled myself in it badly. I saw Jim struggling in a similar net, and became aware that we were surrounded by a dozen or more of the enormous insects.

They eyed us with apparent curiosity. We were probably the first human beings they had ever seen, except at a distance. The company was in command of an officer who ordered the others to lift us from the ground and carry us to a platform just inside the crater. The command was given without speech. We never heard one of them make a sound. Whether they communicate with one another by a sort of mind-reading

or speak in tones of a pitch inaudible to human ears, I do not know.

We were deposited, helpless, on this upper platform. The news of our capture must have spread, because in a few minutes there was a procession of the creatures, walking upright by us and staring down at us from their beady expressionless eyes. Presently some of them, who apparently belonged to a higher order, came and examined us.

Those who came now wore an armor of shining metal, and each of them carried a curious looking rod with a bulb on the end. We were soon to find out what the rods were for. We lay there on the platform, unable to do a thing. If we were left alone, I thought I could manage to get a knife out of my pocket and cut the nets sufficiently to release us. That was out of the question while we were so watched and surrounded.

No attempt was made to search us, and I am inclined to think the creatures regarded our clothes as a part of ourselves.

Jim and I agree that we had been prisoners about an hour when the attack by the sheriff and his deputies started. The first we knew of it was the sound of shots from the other side of the crater. I managed to raise myself enough to see a group of men standing on the rim and blazing away with revolvers. There was a sudden rush of the creatures from our platform, and looking cautiously around I saw that we were alone.

Getting out my hunting knife and cutting the net that bound me was a mere matter of minutes. Releasing Jim was hardly a matter of seconds. We had our guns in our hands ready to help the men, who were still shooting from the other side of the crater, when the thing happened. I was looking at the leader of the men, and suddenly saw a flash of violet flame. It died away, and the men had disappeared. There was another flash of flame, and the man next to him was gone.

Then we saw that, from a platform a hundred feet below us, one of the creatures was pointing the rod he held in his hand at the party of men. Even as we looked several more of them appeared on the platform and directed their rods across the crater. There was a blinding flash of the violet light and a scream of agony from one of the men who was not instantaneously annihilated. Then there was nothing where they had been standing.

Acting on the same impulse, Jim and I sprang for the edge of the crater and threw ourselves down its outer slope. We reached the bottom with no broken bones. I managed to get the dirt out of my eyes first and saw Ike hurriedly poling the dinghy to where we were.

I caught hold of Jim's shoulder and pulled him to his feet. "Can you walk," I asked.

"I'm all right," he panted. "Dizzy, that's all."

I dragged him to the boat and hoisted him in. Then I caught up a pole and in a couple of minutes the mound was hidden from us by the trees.

Jim soon recovered sufficiently to help pole the boat. We struggled to put as much space between ourselves and the mound as we could. I had a very vivid recollection of the effect of those rods when they were pointed at anything. I had no idea over what distance they would work, but I did not feel inclined to take any chances.

Old Ike did not know what we had seen, and he asked no questions. He knew that something was wrong

and that we wanted to get away in a hurry. That was enough for him. I suppose we had poled half the distance to the river before Jim said, "Let's stop for a few minutes, and decide what's the best thing to do."

"We'd better tell Ike what we saw," I suggested.

Jim outlined our adventures to him. When he came to the part about the attack by the group of men on the opposite side of the mound, Ike exclaimed, "By cricky, that must ha' been Bob Hard and his deputies."

"Who's Bob Hard?" asked Jim.

"He's sheriff of this county. He lives in Huntsville, back of the swamps a piece."

"It looks as if we hadn't been the only ones to discover what's going on," I said.

Ike scratched his head. "They musta knowed something or they wouldn't begun shootin'."

"Well, that's what they did. They began shooting as soon as they reached the top of the mound."

"I think we'd better strike out for Huntsville and tell them what happened," said Jim.

"How far is it?" I asked Ike.

"Nine or ten mile, t'other side of whar we wuz."

"It's out of the question for us to pole the boat that far on top of what we've already done," I said. "Besides, it would take too much time."

"Any road to Huntsville?" Jim asked Ike.

"Y'all can get there by ottermobile from Bryceville, up the river a piece."

"How far is Bryceville from here?"

"Five, six, seven mile," Ike replied vaguely.

"Do you know how to get there?" He nodded. "All right, that's where we'll go," I said.

Bryceville proved to be a hamlet of bare unpainted shacks erected on stilts. There were two or three decrepit Fords there, one of which we succeeded in hiring. When we told the man, from whom we hired it, where we were going, he suggested that we buy the car from him and he would buy it back when we returned.

"What's the matter?" asked Jim. "There's a road to Bryceville, isn't there?"

He looked at us quizzically. "County paid for a road. I'm not saying what it got. That tin Lizzie of mine don't swim none too good. That's why I reckon you better buy her."

But we never learned how bad that Huntsville road really was. We had gone only about a mile from Bryceville when the fire broke out. I call it a fire because that is what the newspapers called it. They acknowledged that it started with surprising suddenness, and that it was very curious that it could dry up a swamp and ignite the peat that underlay the water.

Newspapers are conservative about some things. When I called the attention of a Memphis editor to the fact that peat had never been found in that part of the country he replied, "That is what makes it so remarkable, that a stretch of country twenty miles across should continue to burn for days."

"Do you realize," I asked, "that that whole twenty miles was a swamp, with water from two to four feet deep a few days ago?"

"Of course I realize it. I've gone hunting in that section a hundred times."

"Then are you going to keep on saying that the swamp was a peat bog, and that nobody knew it, until it got on fire?"

"Well," he answered blandly, "I'd a blame sight rather print that than what you're trying to tell me. Suppose I had a story in tomorrow's paper about a meteor that was really a ship manned by intelligent roaches as big as men, landing in Big Eagle swamp and then setting it on fire with some sort of infernal machines?"

"It doesn't sound very probable," I admitted.

TO go back to where we started down the Huntsville road. Jim was driving the car and Ike was sitting in the front seat with him. I was stretched out in the tonneau, and I think I was half asleep. Suddenly I was wide awake at an exclamation from Jim. He had stopped the car and was standing on the seat.

"What's the matter?" I asked.

"Lord knows what it is. Look quick!"

I saw the great volumes of smoke before I saw the level beam of violet fire. The road was higher than the surrounding swamp, and standing on the seats of the car, we could see a long distance. The beam looked like a searchlight, except that instead of being white it was violet, and that as it slowly revolved toward us, everything it touched burst into flame.

Jim and I recognized it at once as the beam, on a larger scale, that had annihilated the sheriff's party at the meteor crater. As it slowly swept toward us in a great arc, we had no reason to doubt that we would be similarly annihilated in a few seconds more. There was nothing we could do.

Jim's face was white as he reached over and shook hands with me. Old Ike did not know what was coming, but he must have seen from our expressions that we thought we were done for. He straightened himself up and faced the approaching beam without flinching.

Suddenly we were engulfed in a cloud of black smoke, which concealed what was happening. I wondered what it was going to feel like, when the beam reached us, and was anxious to have it over with. Seconds passed and the smoke became denser, but nothing else happened. Then there was a breath of wind which lifted the cloud for a moment, and we saw an advancing forest fire about a mile distant. There was a wave of heat from it, which brought us all back to earth.

"It didn't reach us!" exclaimed Jim.

"It might just as well, if we don't get out of here pretty quick," I said.

We managed to turn the car around and start back toward Bryceville, a little ahead of the flames. We had singed hair and eyebrows and were as black as crows when we reached the first group of Bryceville inhabitants, who had turned out to see what was happening.

"Better start a back-fire, if you want to save the town," said Jim.

The storekeeper, who had sold us the Ford, seemed to be the leader of the men. "The town ain't in no danger," he declared, "less'n the fire burns water, and that ain't likely."

"That's all swamp land that's burning now," said Jim, pointing to the immense column of smoke which we afterward learned was twenty miles in diameter.

The storekeeper shielded his eyes with his hand and looked at it. "I notice it ain't spreadin' none this-away."

In a few minutes we all realized that it was not

spreading in any direction as far as we could see, but was burning as fiercely as ever. Finally old Ike remarked, "That's the durned funniest fire I ever seen, and I seen a few."

"What's funny about it?"

"The way the dum thing stays in the one place. A forest fire travels quick. What the heck is burnin' in thar?"

I glanced at the natives, who nodded their heads in solemn agreement.

It was not long before the newspaper reporters arrived. We found out from them that there had been considerable loss of life. Huntsville and one or two other villages had been destroyed, and apparently none of the inhabitants had had sufficient warning to escape. We suddenly thought of Ike's family and our boat.

The *Commercial Appeal* reporters had come down the river in a fast launch and cheerfully fell in with the suggestion that they take us to the place where our boats had been tied up. The wind had changed and was blowing a pall of black smoke over the river, making it nearly as dark as night.

We soon discovered that the fire had reached to the river's edge. Our launch crawled along in the smoke as near the levee as we could safely go. If Ike's relatives had had time enough when the fire started, they might have unfastened the boats and let them drift down the river. We soon realized that if they had not done that, they were gone.

As we approached the place where the boats had been tied up the heat of the blazing forest forced us out into midstream. "Guess there's nothing doing, boys," said one of the reporters. "What about getting back to Bryceville?"

Here Ike interrupted us. He tapped me on the shoulder. "That's them," he said, pointing across the river. "Them's our boats."

As it turned out, Ike's family possessed more intelligence than we had given them credit for. Their boat and ours were safe though a little scorched. So was the family—safe though a little scorched. They had not had much time when the fire started, but they had succeeded in getting our engine going, and towed the other two boats across the river to safety. We left Ike and went back to Memphis with the reporters. Ike and his family had met as calmly as usual. If they were glad that Ike was safe, or if Ike was glad that they were safe, they gave no outward evidence of it.

As for us, we soon found from the effect of tentative remarks that there was no use telling the reporters what we had found out. Jim and I talked things over and decided in our own minds what had probably happened. We concluded that when the insect-like creatures found we had escaped, following the attack of the sheriff's men, they decided to destroy us and make their position impregnable at the same time. They had evidently control of a fire ray which set everything ablaze that it touched. They had swung this ray around in a great ten mile circle from the meteor crater. It had not only burned the forest, but it had dried up the water and set the earth underneath on fire.

This does not sound possible, but there is that earth burning now. We are quite convinced that the roach creatures know exactly what they are doing, and are safe in their crater now. We both feel that they intend to conquer the earth and destroy or enslave the human race. From what we have seen of them, we are afraid they will do it, unless we humans can destroy them first.

There is no way to tell how many of the "meteors" landed on the earth. Perhaps a great many. Some may have been destroyed, but many more may have survived. Scattered over the earth, in secret places, are perhaps other colonies of these creatures, preparing for a war against humanity.

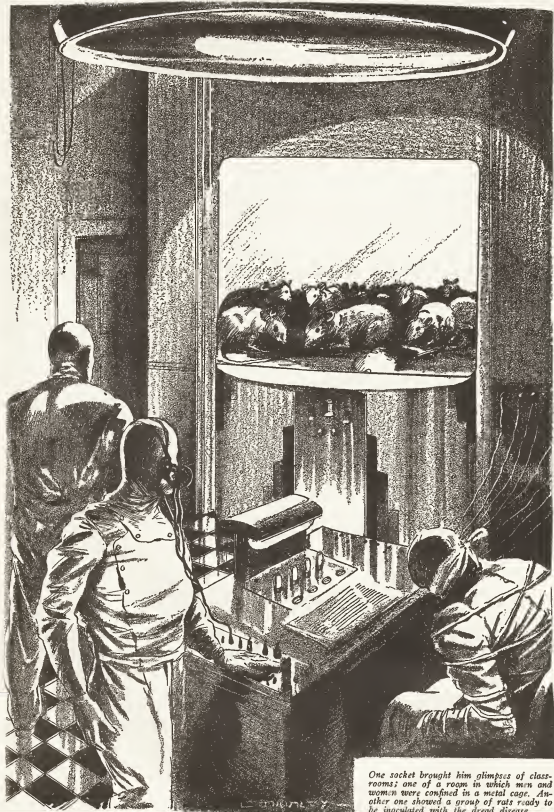
THE END.

Meteor

Out of the boundless silence of the night
Courses a sudden gem of silver light,
Hurtling unchecked in meteoric flight,
And then is gone.

Out of the boundless mystery of Time
Rises a mighty race, a race sublime,
Children of knowledge, in one breathless climb,
And then is gone.

—P. SCHUYLER MILLER.



One socket brought him glimpses of classrooms; one of a room in which men and women were confined in a metal cage. Another one showed a group of rats ready to be inoculated with the dread disease . . .

The Superman

By A. H. Johnson

Author of "The Raid of the Mercury," and "Phagocytes"

ACCORDING to this author, danger seems to lurk even in the highly efficient work of the Health Bureaus and Medical Research Laboratories. It is some hundreds of years now since there was a very serious plague in civilized countries, and as research continues to develop and to get better and better results, the dread diseases may some time be wiped out entirely. And therein lies another danger, for the less fighting the human system is called upon to do, the more susceptible it must become to the dangers caused by the invasion of foreign elements. The story touching on germs brings us to another important question: *What form is future warfare likely to take?*

Illustration by MOREY

LOTHAIRE was exercising in his gymnasium. When at home, and whenever possible when away, he followed a regular routine of an hour's exercise a day. First came twenty minutes in the swimming pool. He swam with deceptive ease, using a stroke that hardly made a splash, but that pulled him through the water with the speed of an otter.

After swimming came his fencing lesson. Here he donned mask, chest protector and leather gauntlet. From the way in which he handled the long, thin foil, it could be seen that he was an expert. The hand that grasped the basket-covered hilt was small, with beautifully tapered fingers, the hand of an artist, but it was as a malignant artist that he used the weapon. His opponents, experts carefully picked from the whole country, seemed to move heavily and clumsily in comparison. He touched them almost at will and with no gentle stroke. Once his point struck fair on the chest of his opponent and the force of the thrust bent the blade almost double. Again it touched unprotected shoulder and upper arm, and both times the only slightly flattened point gouged deep furrows in the skin. Even while he was in the swiftest motion, using every atom of strength and skill, his face remained quietly expressionless. This immobility of face tended to give the impression that it was the moving, striking blade that was alive, and that the man was the inanimate partner of the two. It seemed to be the blade that gloried in making its opponents miss

their thrusts, as a squirrel will sometimes play with a cat, making it miss its leaps by superior speed. It seemed to be the blade that rejoiced as it came into heavy contact with padded chest-protector or gouged into soft flesh. It was the blade that seemed to withdraw reluctantly from the padding of the protector or with a purring rip, that left new welts, from the skin. For the last five minutes of his twenty-minute period, Lothaire faced two fencers at once. This is a feat which has been frequently performed in story, but almost never in actual fact. The interval of time necessary to parry one stroke is nearly always sufficient to allow the weapon of the other opponent to go home. But Lothaire did not wait for this to happen. He kept both fencers at a distance and when they came in, he touched one and sent the other's foil flying into the adjacent swimming pool.

With only slightly accelerated breathing, he entered on the last of his exercises—hand-to-hand fighting. His usual opponent in this department was away, and he had purchased an immense slave for this purpose. The slave was as powerful as an ox. He had great, knotted muscles; he weighed probably 225 lbs. to Lothaire's scant 160 lbs., but from the first the outcome was certain. The slave having been told to fight in any way that he preferred, rushed upon his master with outstretched right arm, in an attempt to get hold of him. Lothaire shifted slightly to the left, bringing his own right arm up in such a way as to shield his body. He caught the slave's arm across his in such a way as a

man might do to ward off a blow from a stick. Then he swung his left arm around the slave's right, grasping his own right forearm with his left hand, and surged forward.

It was one of the deadliest of wrestling holds. The slave saved himself from a broken arm only by his great strength, and at the cost of badly wrenched muscles. With a cry of pain he staggered back. Lothaire's right arm was still bent across his chest. With a smart flick of the muscle, he snapped it straight, striking the slight bulge in the slave's throat with the outer edge of his hand held flat and stiff. This blow, which was probably originally discovered by the Japanese, is extremely dangerous. It strikes at one of the vulnerable points of the human mechanism, having a strong tendency to completely close the throat to the passage of air, as well as affecting the jugular vein. It stretched the slave, senseless and gasping, on the floor. Lothaire watched his twitching muscles for a moment and then ordered one of his attendants. "See that he recovers if possible. He is a clumsy fool, but he's too valuable to lose unnecessarily."

After this he left the gymnasium to submit himself to experienced rubbers and bathers.

The slave lay motionless for several minutes after Lothaire left, in spite of the careful ministrations of the handlers. Finally he gasped a little and moved slightly. A moment later he was able to talk.

"By Plutus!" he swore, careless of who might hear him, "I would like to get my hands on that dancing master."

"Hush!" said one of the attendants anxiously, "you could do nothing with him. He is as strong as he is quick. Besides, it's ill-luck to speak badly of the master, especially such a master as ours."

"Whose son is he and where was he trained?" asked the slave. "I have never been so beaten in my life and I have fought often."

The attendant, who had spoken before, glanced hurriedly around the room and seeing that the slave and he were now alone, answered in a low voice. "He was the adopted son of Hugo Hekla, prince of the second cycle, and at his death succeeded to his rank and power. Now he is second in power in the Plutocracy and it is said that he will become Pontiff as soon as the office is vacated. But, Andreas," here his voice sank still lower, "as to his origin, it is rumored that it is queer indeed."

"It is said, and I read it, too, when I was an attendant in the library of the Council of Plutus, that ten thousand years ago, or perhaps much more than that, there was a democracy in our country, at which time the people elected their rulers, and there was even a brief period when there were no slaves. The country was called the United States then. But it did not last long. It is said that the rich men really controlled it in secret long before they did so openly."

"One of the richest men of that time was known as Henry Bridge. He had, as a friend, a very great scientist, whose name was Arvid Mendelson. It was this Henry Bridge who founded the Scientific Kingdom, which was first ruled by Mendelson. Perhaps you know the place. It is about one hundred miles square, situated almost in the middle of our country, on the banks of what used to be a great river. No one can enter it without special permission. Well, it is written that this Mendelson was a very great biologist; he was said to be

responsible for many of our best varieties of grains and cattle. He got his results by scientific breeding and he claimed that he could do the same thing for the human race if he had the power. Some even say that Henry Bridge gave him this power, and that Mendelson began to breed human beings in the Scientific Kingdom in the same way that he bred cattle, and that his successors have carried out his plans—that today there is a specially developed race in the Scientific Kingdom and that Prince Lothaire is one of them. Certain it is that he has powers no ordinary man can boast. He is recognized as one of the ablest of the leaders of the Plutocracy. And as for personal strength, he can take care of any two men I ever saw. And he is cruel as he is able. He grinds his estates to the last notch; he works his slaves and servants to the limit of endurance. Thousands of his slaves have disappeared. It is rumored that he has carried them to the Scientific Kingdom to experiment on. In the Council of Plutus he is always in favor of laws that will reduce the skilled workmen and middle-class to the ranks of slaves. It was he who supported the laws that made minor offenses punishable by enslavement."

"Did he?" growled Andreas bitterly, "then I have two debts to settle with him. I was made a slave for knocking two teeth down the throat of an officer of Myrmidons, when he tried to kiss my sweetheart."

The other looked around apprehensively as though he feared this outburst might be heard, then he continued vehemently. "We all *hate* him here, but it is not safe to say so, for he has spies everywhere. Our only hope lay in the Black Groups, but lately the punishments have been so terrible, that they are not doing much. But now Prince James Lancaster has raised the flag of revolt. He captured a great trans-continental liner with Lothaire on board, but like the slippery eel he is, Lothaire escaped. It is rumored that the Lady Avic De Loyola is married to Prince James and is aiding him with all her wealth. The Black Groups are busy spreading propaganda among the slaves and workmen. Yes, I think we have reason for hope now."

The slave Andreas felt his sore neck and then said, "If this Prince James is an enemy of our master's, he is a friend of mine."

MEANWHILE Lothaire was seated at the foot of a table, around which were twelve chairs. The table was of ebony and the chairs were ebony inlaid with ivory. It was in the center of a great hall with floors and walls of marble. The room was lit by a kind of light that cast no shadows, illuminating all parts of the hall equally. Near one end of the hall, which was oval, was a group of statuary, carved in pure gold, and depicting the ancient Plutus, God of Wealth. At the other end of the hall was a single alabaster figure of large proportions. It was a female figure of extreme beauty, and under one arm was a large cornucopia, or horn of plenty, from whose open mouth was pouring what seemed to be a never-ending stream of precious gems and gold. Rubies, diamonds, sapphires, opals and other gorgeous gems mixed with gold coins fell into a basin below the figure. Some delicate and well concealed machinery kept the stream flowing. On the walls were friezes representing the power of wealth, and mottoes, inlaid with rare metal expounding the virtues of gold.

Lothaire rose and bowed respectfully, as an old man, dressed in a gorgeous white and gold robe entered, fol-

lowed by ten other men, similarly attired but less magnificently. The ten took seats around the table; the old man sat at the head of the table, and Lothaire at the foot. This was the great council chamber of the Plutocracy and these twelve composed the Council of Plutus.

The old man addressed Lothaire.

"Vice-Pontiff," he said, "we await your report."

"Pontiff and Brothers," began Lothaire, "my report is not wholly favorable. My secret agents have been busy. They report extreme unrest in all the southern provinces. Reports are freely circulated that James Lancaster has married the Lady Avice De Loyola and that they intend to destroy the government of the Plutocracy and substitute for it some kind of limited monarchy or republic. The slaves and workmen are all in favor of them and it is only the Myrmidons that hold them in check. The Black Groups are active as never before; they are spreading propaganda among the slaves and workmen. The situation is dangerous, to say the least. Here we are, perhaps ten thousand nobles, with approximately a hundred thousand servants and dependents whom we can trust, confronted by a hostile and restless population of three or four hundred millions. The Myrmidons are with us, of course. They couldn't hope for much favor from Prince James after the sack of his father's principality.

"I assure you that everything possible is being done. At present, the Myrmidons have the situation in hand. They are prepared, in almost every city of size in the country, to gas the slaves in the ghettos at the first sign of trouble. Our troops and secret agents are busy trying to find the hiding place of Prince James and the Lady Avice. We have planted listening devices over one thousand square miles of territory where his ships disappeared from our pursuing fleet. Our agents are trying to penetrate the Black Groups. Our navy is mobilized ready to convey our troops in any direction at any time. If the storm breaks I am in favor of giving the people such a lesson that not for another ten thousand years will they think of revolution. All we can do now is to wait."

As Lothaire talked, two pairs of eyes watched him with the greatest intensity from niches high up on the wall. The owners of these eyes were concealed behind statuary, and neither was aware of the other's presence. One was dressed in a black robe with a white skull embroidered across the chest. His face was concealed by a black mask. In his hand was one of the variety of pistols whose sale had long since been prohibited, a weapon whose bullet was poisoned so that the slightest scratch meant death. From time to time he pointed this weapon at Lothaire and then lowered it as some member of the group below happened to glance in his direction, or as his target happened to move. He did not fire, perhaps because he saw that escape after the shot was impossible. This man had entered his place of concealment some time after the council had begun. He had come by way of a narrow gallery around the wall about midway between the floor and ceiling. He was tall and thin, and as he removed his mask for an instant an observer might have seen the features of the attendant in the gymnasium who had talked so earnestly to Andreas.

The other hidden spectator was quite different. He was a powerfully built, blond young man, dressed in the short belted tunic which is the uniform of an atman of Myrmidons. He was strikingly handsome, with clear

blue eyes, broad shoulders and narrow waist and hips, and powerful arms and legs. A slightly curved sword hung at his side and at his belt was a kind of box containing gas bombs. His face showed that he was under some emotional stress, and with a fixed and hostile gaze he watched Lothaire.

FINALLY the council below came to an end. The councilors filed out, leaving Lothaire working at the table by himself. Still the two watchers remained.

Presently a man, whose uniform showed him to be a captain in the air fleet of the Plutocracy, entered hurriedly and walked up to Lothaire, saluting smartly.

"Well, captain," said Lothaire.

"I have splendid news, sir," said the captain, "as you know, sir, I command one of the cruisers patrolling in the Delta Section. Early this morning we saw a fast air-boat moving toward the city. We commanded it to stop, and, when it failed to do so, fired on it. After a sharp skirmish we captured it and the Lady Avice was on board, sir."

"Why was this news not sent in by radiogram?" asked Lothaire.

"Our sending set was destroyed in the fight, sir," was the reply.

"Where is the lady, now?"

"Outside, sir."

"Send her in," said Lothaire. A gleam of triumph flitted over his usually calm features.

A moment later a tall slender girl entered between two guards. She was, perhaps, eighteen or nineteen, and wonderfully beautiful. Her hair was black as night and her skin the tint of pale ivory. Her eyes were dark and shaded by long and lustrous lashes.

The oval beauty of her face expressed both intelligence and strength of character. Walking between her guards she bore herself proudly and faced Lothaire without flinching.

Lothaire rose and bowed politely, asking her to be seated.

She replied in a clear cool voice, "Thank you, I prefer to stand in the presence of my captors. As Princess of Orleans, I am an independent ruler and not responsible to you or any other officer of the Plutocracy. I demand to be set at liberty at once."

Lothaire frowned slightly.

"I am afraid, Madam," he said, "that we cannot grant this request. It is rumored that you are now the wife of the traitor known as Prince James Lancaster. Is this true?"

"You have no right to question me," was the firm answer.

Lothaire smiled.

"Perhaps later, under the influence of certain persuasions, you may feel more inclined to talk," he said. "But wait. Let us not discuss such unpleasant possibilities. We may be able to arrive at a mutually pleasant agreement. Let us assume that you have been so foolish as to marry Prince James. It can be remedied; you can divorce him in the courts of the Plutocracy and even regain your estates, which were of course, forfeited, when you became the wife of a traitor. And in return for this, we only want one bit of information."

"Indeed?" was the icy response.

"Yes," said Lothaire, "all we want to know is Prince James' hiding place."

"You will never learn that from me."

Lothaire smiled again, more suavely than before.

"I am afraid, Lady Avicé, that you do not clearly realize your position here, or our forces of persuasion," he said smoothly.

"I am not afraid to die!"

"I said nothing of death," replied Lothaire. "The leading men of our country have long recognized that death is a wasteful form of punishment. That is why we have substituted slavery for it. A dead man is of no use to anyone. A live slave always has a certain value. A value," he added with a keen glance of appraisal at the beautiful girl before him, "that is sometimes very great."

Seeing the girl shudder he paused for a moment to let his words bear their full weight, and then continued: "But I do not think that you need fear any such fate. Your case is unusual and demands unusual treatment. Still, the State could not afford to kill you. It would be too wasteful. Women of your splendid physique and intelligence are badly needed in the Scientific Kingdom."

He paused again to watch the effect of his words on the horror-stricken girl, then said suavely, "Our scientists there are working on the very interesting problem of hybrid vigor in regard to the human species. They are particularly interested in the question of whether or not hybrid vigor will develop in the F¹ generation of a cross between the negro and Caucasian races. You——"

But this sentence was never completed. The girl, terrified by Lothaire's carefully calculated threats, fainted. At the same time, the young man, who was concealed on the gallery, got into swift action. Ever since the girl had entered the room below, he had shown increased agitation. In his interest in the scene he had gradually emerged from the shelter of the statue behind which he had been hiding and leaned on the rail of the gallery, fully exposed to the gaze of the actors in the drama below. Their absorption in what was occurring between Lothaire and Avicé alone prevented his discovery. As Lothaire's words gradually became more and more threatening, the man on the gallery first fingered his sword, and then, at Lothaire's final sentence, he swung himself over the gallery railing and down to the floor, by means of the heavy hangings that covered a concealed niche in the wall. So quickly and silently did he move, that the first intimation of his presence came to those on the floor, when he felled one of the guards. In an instant, another guard and the captain of the Air Force attacked him.

Lothaire, inhumanly cool, took no part in the attack. He quietly drew a pistol from his pocket and leveled it at their assailant. Brave enough when occasion demanded, he, nevertheless, took no unnecessary chances. He took quiet aim, just as though he were seated in a shooting gallery, and in a moment would doubtless have ended the struggle, had it not been for an unlooked for circumstance.

The figure in black on the gallery evidently thought it time to act. He, also, took careful aim and fired, just as Lothaire's finger tightened on the trigger. The bullet, slightly misdirected, struck Lothaire's arm near the wrist and ranging toward the shoulder, it traversed almost the whole length of the arm, emerging between elbow and shoulder. The pain must have been excru-

ciating, but Lothaire still tried to save himself. Seeing the figure in black on the gallery, he murmured, "The Black Groups!" and fumbled desperately in his robes with his left hand. In a moment he had thrust a capsule in his throat and swallowed it; then, and not until then, did he relapse into unconsciousness.

As soon as he had fired, the man in black, none other than the gymnasium attendant, rushed from the room through a gallery door. Dashing down several passages, he removed his mask and turned his cloak inside out, in which condition it appeared to be merely the ordinary attire of a poor freeman. He kept on his way until he found the ante-room of the building in which Lothaire's attendants were waiting. Hastily drawing the slave, Andreas, aside, he whispered, "Would you strike a blow for Prince James and freedom, and against our master?"

"Aye, Ross," was the prompt answer, "for anyone of the three reasons."

"Follow me then," said Ross, and he led the way back toward the Council Chamber.

MEANWHILE events were happening rapidly in the Council Chamber. Taken by surprise, the officer and guard had drawn back from the attack. But their assailant pressed on revengefully. With a mighty sweep of his sword he beat down the officer's guard. The guard took one look at his three companions, all stretched senseless on the floor, and then fled at the top of his speed.

Paying no attention to his flight, the young man knelt by the side of the girl. He raised her head tenderly and in a moment she opened her eyes.

"James!" she murmured in astonishment. Then, in fear, "They *mustn't* get you, too."

"They shall not get either of us," he replied. "I have a ship on the roof and if we can reach it, we can escape."

Then, as he heard people approaching, he asked in a gentle voice, "Are you all right, darling? Wait, don't try to walk, I'll carry you."

Lifting her, he dashed up a small spiral stair that led to the gallery, then quickly he went along the gallery to the same door through which the man called Ross had disappeared. As they reached the shelter of the doorway, a detachment of Myrmidons entered the hall below and, seeing the fleeing figures on the gallery, they fired a volley of shots. The fugitives avoided the shots by standing close against the wall of the passage.

"I must hold them for a moment, anyway," James said. "We will need time to find our way through these passages to the roof."

Then, opening the package at his belt, he removed several small cylindrical objects and adjusted some piece of mechanism about them and hurled them into the hall below. A moment later the hall was full of deadly gas. The Myrmidons either dropped in their tracks or rushed hastily away. Only a few were near enough to the entrance to escape. Ten of them, bolder or quicker than their fellows, had already mounted the steps to the gallery.

Without waiting to see the effect of his bombs, James hurried along the passage with Avicé and up toward the roof. Suddenly two figures appeared in front of them. Ross and the gigantic figure of the slave, Andreas. Thinking them enemies, James was about to rush them, sword in hand, when Ross spoke.

"We are friends, Prince," he said. Then turning his cloak so as to show the death's head, he said, "See, one who wears this insignia is never an enemy to Prince James?"

"Thank you, friends, you are badly needed," said James.

"Follow me," said Ross. "The passage by which you entered, Prince, is guarded. We must reach the roof by another way."

Under his guidance they moved swiftly and surely upward. A few moments later they could see the light of day, where the passage emerged on a small balcony, from which it was easy to reach the roof. But just as they were about to rejoice in their success, Ross gave a cry of despair. A heavy iron grating blocked the end of the passage.

"By Plutus! I might have known it," swore Ross, "These gratings were Lothaire's idea to prevent anyone from leaving the Council Hall in case of a disturbance. They are lowered automatically over all exits when an alarm is sent out to the guards."

James heard a shuffle of footsteps along the passage behind them. A moment later the ten Myrmidons, who had escaped the gas in the Council Chamber, appeared at some distance down the passage.

"We are three against ten," said James. "That's not hopeless odds. Let us show them that we are men."

They took shelter behind a corner of the passage, and waited. Andreas was armed only with the leg of a table, which he had hastily ripped off when he answered the summons by Ross. James had his sword and Ross his pistol.

Two of the Myrmidons rounded the corner a little in advance of the others. There was a crunching sound as one fell, with his head crushed by a mighty blow of Andreas' club; the other barely had time to utter an exclamation of surprise before James' sword cut him down. The rest came all together. A fierce, though comparatively silent, struggle raged for several minutes in the narrow passage. James' sword flashed in and out, occasionally varied by a terrific overhead sweep. Andreas' club, dyed red near the end, rose and fell with regularity. Ross stood slightly in the background, guarding Avice, afraid to fire unless absolutely necessary, because of the danger of attracting more assailants.

Just then Andreas' club was knocked from his hands, and the Myrmidons uttered a cry of triumph. Andreas, although wounded, answered with a bull-like roar and rushed upon them. He threw his great arms around two of his attackers, and exerting his strength to the utmost, lifted them from the floor, dashed them against the wall, and used their bodies as flails to strike at the others. James, the grim light of battle in his eyes, charged with him, cutting right and left. With one blow of his sword he cut a Myrmidon's head from his shoulders, as a man might strike a flower from its stem with his walking stick. Horror-stricken, the remaining five Myrmidons drew back, and seeing that they were going to use their firearms, Ross entered the struggle. Shooting with deliberate aim, he dropped two of them almost at once. As the others turned to fly, James cut down a third, and the struggle was over as quickly as it had begun.

"We are still cornered like rats in a trap," remarked James coolly, resting the point of his sword on the tile floor. He was bleeding from several slight cuts but his

wonderful swordsmanship had saved him from serious injury.

Ross shook the steel grating furiously.

"I am afraid, Prince," he said despairingly, "there is nothing to be done."

Andreas shook himself, uncertainly. His great frame had borne the brunt of the battle and he was bleeding in a dozen places.

"Let me see the bars," he rumbled.

Walking up to the grating, he seized two of the heavy iron bars in his great hands, and, bracing himself against the floor and walls, he pulled on them, until the mighty muscles in his back and shoulders stood out like knotted cords. At first there were no visible results. Then the bars bent almost imperceptibly, then more and more widely. There was a rending sound and one of the cross pieces was torn loose. Now it was wide enough for the slim body of Avice to slip through. Soon it was wide enough for Ross' angular frame; then for James'. Still the giant tugged and presently there was a hole that a bull could have rushed through. Without another moment's delay, they all stepped out on the balcony, and hugging the wall, to minimize the chance of being seen from the ground, they climbed up on the roof. Fortunately, no alarm had yet been sent out to the air police. There was too much confusion in the building below for that. Quickly they approached James' small, cigar-shaped, two-man craft. It was equipped with powerful horizontal and vertical propellers, specially built for speed. At the most, it would carry three people.

James, realizing this, ordered Ross and Andreas aboard with Avice, saying that he was going to steal another boat from a nearby roof. But Ross, knowing the impossibility, called him back. "Nay, Prince," he said. "You must run the ship yourself, for neither Andreas nor I can do it. I must stay in any case. A member of the Black Groups cannot desert his post. Besides, there is not much danger to me. I will merely say that I followed you out here, in an attempt to capture you. It is possible that I will even receive commendation for my courage. Most of those who saw me fight for you are dead, and I doubt if the others can recognize me. Go quickly, Prince, and may Fortune go with you."

Without waiting for a reply, he dashed back the way he had come. James started the motors slowly and, once past the edge of the roof, dropped the ship low over one of the streets; concealed by the buildings on either side, as by the walls of a canyon, he swept toward the edge of the city with the speed of a meteor. Only a few desultory shots were fired and the air-police were unable to locate them until they came to the edge of the city. Then it was too late, for James' ship could outdistance almost anything.

Once out of sight of the city, Andreas flung himself flat on the deck and proceeded to go to sleep. Avice sat by James at the controls.

"How in the world did you happen to be in the Council Chamber of all places, James?" she asked eagerly. "I thought you were at least a thousand miles away in the cave in the mountains. Oh, but I was glad to see you!"

"It was all like a horrible nightmare. First our ship was captured near Orleans, where I was going to meet with some of my people to make plans for the revolt.

The whole crew were butchered on the deck, except for one scout, who escaped in a glider. Then I was brought before the Lothaire. He is, I believe, the most inhuman person in the world. Then you came, like a knight out of a story book."

James smiled and put his arm gently around the girl's shoulders.

"You don't know how glad I am that I was there," he said slowly.

"The scout who escaped from your ship immediately sent me a radiogram, telling of your capture. I knew that you would be carried to Lothaire's, so I flew to the City of the Wheel in my fastest ship, and was fortunate enough to evade the police and landed on the Council Hall. I was there before, as you know, in my father's time, so I had no difficulty in finding a place to hide in the gallery of the Council Chamber. The rest you know."

THE next morning Lothaire lay weak and pale on a couch on the roof of his house. Only his quick wit in taking antidote for the poison of the bullet, and the skill of his physicians had saved him. As a result of the wound, of the poison, and of the effect of the powerful drug, he was too weak to move a finger. His right arm was swathed in bandages, and there was some question as to whether or not he would ever be able to use it again. At a time when other men would have refused the slightest exertion, his indomitable will and courage, worthy of a better cause, made him carry on the affairs of the Plutocracy almost as though nothing had happened. He was listening now to the report of his secretary.

Revolt had broken out in over half the cities of the Plutocracy. In Orleans the townspeople had massacred the garrison of Myrmidons. All the southern provinces were aflame. The Kingdom of the South, formerly the province of Prince Edward, James' father, was avenging the ravages committed by the Myrmidons some years earlier. The ships of the Air Navy that happened to be in these towns were seized by the townspeople. Prince James was said to be at the head of a large army. In the other end of the country Ontario had declared for Prince James. In many sections the Myrmidons were besieged in their barracks. The fighting was said to have been heavy and of the most vindictive nature, with no quarter given on either side. The Plutocracy still controlled the great middle part of the country, but it was impossible to say when revolt would break out there, too.

Lothaire's face grew very grave when he heard this news. His lips moved slightly and a person of keen hearing might have heard him say, "It is time to bring out the last reserves. We must have the Supermen."

Then, gathering strength by a desperate effort of will, he said firmly, "Prepare a swift cruiser at once. I leave for the Scientific Kingdom in an hour."

Three hours later, lying on a teakwood bed in his cabin of beautifully burnished metal in the depths of the cruiser, he glanced into the dak-glass. This periscope-like instrument was so arranged as to give any one in the cabin a clear view ahead of the cruiser without the exertion of moving from his bed. The cruiser was moving at a high speed above an almost level and totally uninhabited plain. For the last hour such a panorama had presented itself to Lothaire's eyes when-

ever he glanced into the instrument. It was part of the great central plain of the country, which had been given over to wild beasts and desolation when men abandoned agriculture for factory or synthetic methods of producing food. But now there was a change. A dark mass showed itself dead ahead. Soon this mass resolved itself into a region of fog or clouds that covered the earth and extended to a considerable height into the air. A short distance from this fog-region, the cruiser slowed down and Lothaire heard the crackling sound that marked the sending of radio signals. The signals were evidently satisfactory, for a few minutes later, the fog began to dissolve. In its place appeared a solid rampart of shining metal or stone, which stretched skyward a sheer thousand feet. Beyond and behind it loomed towers and structures that exceeded the height of the wall. This was the boundary of the Scientific Kingdom. In it were all the scientific men of note in the country, and in its enormous libraries were contained all the knowledge that man had amassed in his thousands and thousands of years of progress. The Kingdom was guarded by every device known. The fog was induced by water vapor and an electric current issuing from the wall and could be made denser or dissipated at the will of those within. Great cables, sunk within the walls, carried a powerful electric current, which produced a strong electro-magnetic field around the Kingdom, and the entrance of any metallic body into this field was at once detected by delicate apparatus within. Powerful guns and automatic range-finding devices were mounted on the wall and behind it. Guided by any change in the magnetic field, these range-finding devices would point the guns at any metallic body that entered the field; as well at night as in a thick fog or in clear daylight.

The cruiser crossed the wall and came to rest on a landing platform about half-way up the side of the largest of the tower-like buildings. Lothaire was placed on a litter and carried down a passage to an express elevator. The elevator dropped with electric speed to a level much below that of the ground. Here, in the depths of the building, was the office of the Director, the almost absolute ruler of the Scientific Kingdom. Lothaire was carried into his presence.

The office of the Director was an oval room, perhaps twenty-five feet long by two thirds as much in width. The Director himself was seated before a teakwood table. An apparatus, not unlike radio-headphones, was fastened over his ears and eye-pieces covered his eyes. Wires from these instruments connected with a wall socket. It was this device that had superseded the books of the bygone eras. The headphones reproduced in sound the information in the books, and the eye-pieces produced visual images of diagrams and any other information that could be conveyed by pictures better than by words. By connecting the device to various sockets, the contents of any of the "books" in the library of the Kingdom could be reproduced. On Lothaire's entrance the Director removed this device, and it could be seen that he was an old man of majestic appearance, with high forehead and deep-set, piercing eyes. He rose and bowed politely, but without the servility to which Lothaire was accustomed in the outer world.

"Greetings, Prince," he said in a deep voice. "I am sorry to see you in such ill-health."

Lothaire swallowed a stimulating tablet, composed of

a basis of adrenalin, which had an almost immediate stimulating effect, and replied, "Thank you, Director. You were notified of my coming?"

The Director nodded. "Yes, I am also familiar with the reasons for your presence. Our secret service is active, too, Prince."

"It is well," replied Lothaire. "The affairs of the Plutocracy are at a dangerous crisis. I have come to you for help. If the Plutocracy is to go on, we must crush this revolt. We need the brains of the Supermen."

"We are ready to assist you," was the answer.

The Director turned to an attendant stationed behind his chair. "Inform the Master-Bacteriologist that his presence is required. Tell him to bring exhibit D-4001 from the vaults," he said.

A few minutes later a man, enveloped entirely in silk robes with a face-mask, entered, wheeling before him a stand, which contained various laboratory equipment.

"This is the Master-Bacteriologist," explained the Director. "He bears, with him, the answers to your difficulties."

"Prepare a slide for the Prince," he added to the bacteriologist.

The bacteriologist took a microscope slide glass and placed it below a tube extending from the base of a glass container, which was on the stand before him. The jar, or container, was partially surrounded by a coil of electric wiring.

LOTHAIRE watched intently.

"This jar," explained the bacteriologist, "is, by means of the electric-coil, kept at a constant temperature, approximately that of the human body. It contains a kind of broth, of about the same composition as beef-soup. Within the broth, we have the micro-organism D-4001."

He allowed a small drop of the fluid to smear the glass plate. He then placed the plate below the lenses of a binocular microscope.

Lothaire looked into the instrument. Brilliantly illuminated by specially arranged lighting, he saw a number of short, fat, sausage-like shapes. They were immersed in a hazy medium. In spite of the illumination, the vision was indistinct. He complained of this.

"They are much clearer when stained," explained the bacteriologist. "I have prepared a stained slide also. It is made by dipping such a plate as you now see in some strong dye. Then it is washed in alcohol, which removes the dye from the solution, but leaves some of it in the organisms. They then show up as colored shapes against the background."

He exchanged the slide in the microscope for another.

Lothaire looked again. This time the vision was much more distinct. The bodies that had formerly been dark now stood out as a brilliant scarlet at each end with a lighter color in the middle.

"Very interesting," he observed coldly, "but what is the connection between this exhibit and the object of my visit?"

The Director smiled.

"Form D-4001 has a very interesting history," he said. "In the days before the efficient health service of the Plutocracy, it was responsible for many epidemics, which killed great numbers of people. It was variously known as the 'Black Death,' the 'Bubonic Plague,' and later simply as 'The Plague.' At a very early date in

England it caused an epidemic that killed one-half of the population.

"With the coming of scientific knowledge, it gradually disappeared. For over twenty thousand years not a single case has been known, due to the efficient work of the public health service. It may be said, indeed, that, largely through the work of the experts of the Scientific Kingdom, all germ diseases have disappeared. The last known case of any epidemic disease, with the exception of laboratory cases purposely caused for study, occurred over fifteen thousand years ago. What scientific knowledge has prevented, scientific knowledge can cause. What if a devastating disease should break out in the camps of the revolutionists, Prince?"

Lothaire did not reply for a moment. But his next words made it clear that it was not the horror of the idea that caused his coldly cruel mind to hesitate. "A germ does not know friend from foe," he said, "Suppose the disease spread to our own troops?"

"Rightly handled," said the Director, "that can be prevented. A germ disease is fought by three different methods. One is to prevent the spread of the germs by segregation and quarantine of persons afflicted with the disease. The second is to produce a mild form of the disease by vaccination. That is, by injecting weak or dead germs into the human organism, which then responds by giving immunity for a longer or shorter period to that disease. The third is by treatment of the disease after it has occurred. The best method of treatment is by what is known as an anti-toxin. Germs generally cause their bad effects by giving off poisons, which destroy the body tissue, usually of some particular organ. An anti-toxin neutralizes the effect of this poison. Our doctors have developed both a vaccine and an anti-toxin for D-4001. We will vaccinate such of your men as will probably come in contact with the disease and use the anti-toxin to cure any others that may become afflicted with it."

Lothaire nodded. "Very good," he said, "but if you can prevent or cure this disease so easily, why cannot the revolutionists do the same thing?"

"They have no doctors," was the answer. "All scientists of note in the country are trained here, and most of them spend their lives here."

"They have the District Health Officers on their side," said Lothaire. "Aren't they trained in preventing diseases?"

The Director smiled. "You must remember that germ diseases were wiped out thousands of years ago. The Health Officers have received only a rudimentary training in bacteriology. Few of them could recognize the disease, and none of them has the knowledge or equipment to cure it. There has been no need for them to have this knowledge."

"Well, how are we to proceed?" asked Lothaire. "What are the details?"

"D-4001 is spread by fleas, rats, mice, and small rodents of all kinds," was the answer. "As you know, rats and mice still exist in the slave-barracks and poorer sections of all the cities. All that is necessary is to have a few of your Secret Agents turn loose a few rats that we will provide; and within ten days we guarantee that at least one-half of the population of the city will be dead. The rats have the disease in much the same form as man. The fleas catch it from the rats. When the rats die, the fleas move to other animals or men, taking

the disease with them. Once it is transferred to men, it spreads by personal contact. The fact that men have not been exposed to it for thousands of years should make it much more deadly than it has been in the past. It is well established that when a race of men is exposed to a virulent disease, the ones that are most susceptible to it, die, usually before having descendants; therefore, the longer a race is exposed to a disease, the more it tends to become immune to it. But here we have a race that has not been exposed to this disease for many generations. That means that their immunity to it will be almost zero. Whereas, one-half the population of England died of it, we should obtain results of almost one hundred per cent!"

It was evident that the Director contemplated this wholesale destruction with considerable pleasure. Accustomed, from his childhood, to a strictly impersonal viewpoint, he regarded the proposed slaughter in the light of a general planning the annihilation of a hostile army. He had long banished all vestiges of human feeling from his mind, together with what he would have called all other "prejudices."

"By the way," he added, "we might as well have a demonstration—Vardas" (this to the bacteriologist), "have one of the Kondos brought in."

He explained to Lothaire, "We keep the Kondos especially for experimental purposes."

A moment later a man was brought in between two guards. His arms were bound behind him; and his feet were so fastened as to allow only the shortest steps. He presented a wild and disheveled appearance and uttered meaningless shouts.

At the Director's command he was bound to a metal couch in the room. Vardas, the bacteriologist, filled a hypodermic syringe from the culture in the glass jar and approached the man.

"What are you going to do to that man?" asked Lothaire.

The Director looked at him in surprise. "We are going to demonstrate the effect of D-4001 on the human organism," he answered.

"You mean, give him the disease?" asked Lothaire, slightly shocked in spite of his cold-bloodedness.

"Of course," said the Director impatiently. "He is only a Kondo. We keep the species especially for the purpose. How could we determine the effect of drugs, germs, or chemicals on the human body if we did not have some form of human being to experiment on?"

Vardas washed a small area on the man's upper arm, disinfected it to prevent the possibility of other forms of germs entering, and then prepared to inject the contents of the syringe.

"Several billion of those sausage-like shapes that you just looked at will pass into his arm from the syringe," remarked the Director conversationally. "The D-4001 organism is less than one micron in length. A micron is 1/25,000 of an inch. It would take over ten million of millions of these germs to weigh an ounce. Under ideal conditions for growth, they will breed rapidly enough to double their number every fifteen minutes. Assuming a billion to begin with, in five hours they would amount to over three million of billions. What that would amount to in a day, you can estimate for yourself. Ideal conditions, however, rarely occur for any length of time, so practically, their increase is much slower than I outlined."

The bacteriologist injected the culture into the man's arm. At the scratch of the needle he cried out and Lothaire, hardened as he was, shuddered slightly.

"What language does he speak?" he asked.

"None," was the reply. "Speech is an acquired accomplishment, which men learn from other men who can talk. If a man is raised by himself or with other men who do not speak, he will never learn to talk. This man was raised so. We breed a number of them just as we do other laboratory animals."

He glanced at Lothaire and continued, "You will soon grow accustomed to the idea. It is only in this way that knowledge can progress. It is easy to see that you were educated out of the Scientific Kingdom, even though you do belong to our race. We, of the Supermen, do not regard the Kondos as being any more closely related to us than is any other form of animal life. You know our history. Through the work of Arvid Mendelson we were differentiated at the beginning of the Plutocracy. You know the scientific law that says, like begets like. They started out with a few descendants of the most intelligent persons then alive. Generation after generation, they allowed only those who showed signs of unusual intelligence and physical perfection to breed in the group. Finally, the Supermen themselves continued the experiment. Today, our intelligence quotient is around 210, a full 100 per cent. higher than that of the average man. In addition, we are physically more perfect. We hold most of the offices of importance in the Kingdom and several of those in the Plutocracy itself. You know our plan. When you become Pontiff, we expect to gradually take over the government of the Plutocracy, as well as that of the Scientific Kingdom. The Supermen shall rule the earth."

As he spoke, the Director rose from his chair and paced the room excitedly.

"We shall rule," he continued, "because we are best fitted to rule. Always the lower organism must give way before the higher. In the dawn of history man destroyed or mastered all other of the animals. The ones that he allowed to live, he used solely for his own benefit. Today we stand in much the same relationship to man, as he did to the beasts. The only difference is that physically we are almost identical with the ordinary species of man. But mentally we are much superior to them. In exceptional cases it may be well to admit exceptional individuals to our ranks. But for the most part, we must rule them. Only in this way can progress go on. The Plutocracy was a step toward our rule. Under it ten thousand nobles ruled three or four hundred million people. But the nobles are little, if at all, more intelligent than the people. They prefer to spend their time in the Cities of Pleasure to working in the departments of the Government or in the Army. They will not be hard to overthrow after we have finished with this revolt."

"I am not so sure," answered Lothaire. "They have one quality that not even a Superman can sneer at! They have *Courage*!"

The Director smiled.

"A wild animal has courage," he said. He walked over and looked at the man on the couch. So far, he showed no bad effects from the injection.

"This man has courage, probably," continued the Director. "Yet in four days he will be dead, unless we save him by means of the anti-toxin."

"If it were not for our plans to take over the government of the Plutocracy, we would not bother to save it from Prince James' revolution. Why should we care? Even if he desired, he could not harm us. Our fortifications are impregnable. Our soldiers are the best in the country. It would matter little to us who ruled the Plutocracy, if we could not."

It was evident that Lothaire did not entirely agree with the Director, but he only said, "We must act in a hurry, if any good is to be accomplished."

"We will have the infected rats ready for you in an hour," was the reply. "To spread them, we will lend you two hundred of our men who are inoculated against the disease and know how to handle the animals. With the aid of your Secret Agents, they should be able to free some of the rats in the nearer cities tonight, and within two days the disease will have begun. Vardas, go and see to the preparation of the rats."

"I would like to see him prepare the rats," said Lothaire.

"It would not be safe," was the answer. "There would be a great chance of your contracting the disease. Vardas and his assistants are protected by their laboratory costume, which covers even the face. In addition, they are usually vaccinated against the particular germs with which they work."

"Then I shall return to the Capitol," Lothaire stated. "Have your men and the rats sent after me."

IN the meanwhile, the cause of the revolution was everywhere prospering. James placed his temporary capital in Lavan, an ancient city located on the river valley of the Mississippi, about 600 miles from the Gulf of Mexico. Here he was busy changing the crowds of slaves and workmen into an army capable of dealing with the well-disciplined Myrmidons. His plans worked out so perfectly that his men had caught even the Air Navy unprepared and captured most of the ships stationed in the cities. The work of training crews for these ships was proceeding rapidly. James received much help from the Secret Society called the Black Groups. It was largely their activity that had prevented the agents of the Plutocracy from gassing the slaves in their barracks at the first sign of the revolt.

The day after Lothaire's visit to the Scientific Kingdom, James was dining with several of his officers. Aurelius, his lieutenant, was at his right, and Andreas, who has attached himself as a bodyguard, was standing behind his chair. Avic was in her own city of Orleans, hundreds of miles to the south, negotiating with her subjects for money for the revolution. James was speaking of the great progress that had been made by the revolution: pointing out that a short time ago he had been little more than a pirate chief, and his total force had not exceeded a thousand men, his navy had been composed of a single ship; now the army numbered nearly a million, and thousands of ships were contained in his Air Navy. Suddenly his words were cut short by the sound of a scattering volley of shots outside. Then there was the sound of running feet and a challenge from the guard. James and his officers rushed out. The captain of the guard was bending over a figure in the uniform of an officer of Myrmidons that lay on the ground. At James' approach, the captain saluted and said, "This man says he must speak with you at once, Prince."

James looked at the man. It was clear that he was dying. One shot had evidently penetrated the chest and there was a foam of blood about his lips. Already his eyes were dull, with the glaze of death.

"You are Prince James?" he asked feebly.

When James nodded, the men continued, "Listen closely, Prince. I came from Ross. He dared not trust a radio-gram, for you are surrounded by secret agents of the Plutocracy, and it might have been intercepted. It was their secret agents who shot me just now. But I am in time—" He was interrupted by a fit of coughing. He gasped for a minute and then continued urgently, "Lothaire's agents are spreading the Black Death among you. Must—prevent—it—or—half—your—men—dead—in—six—days. Ross—he—says—anti—"

Another fit of coughing rendered the closing words entirely unintelligible, and when the coughing ceased, the man lay still—dead.

He turned to the guard, "How did this man get here, and who shot him?"

The captain of the guard answered, "He landed in the street from a one-man glider. Where he came from or how he got past the air police, I don't know. He had left the glider and was coming toward us, when someone in that little group of beggars who have been hanging around in the street for the last two days, spoke to him. He ran toward us, but one of the beggars shot him and fled."

"If any of those beggars return, arrest them on sight," James said sternly.

Aurelius knelt beside the body. In examining it, he turned back the cloak, and there showed an embroidered death's-head, the emblem of the Black Groups.

"His Myrmidon's uniform was only a disguise," he said.

"By Plutus, I would give much to know the rest of that message," said James. "Now we know that he meant to warn us of some grave danger, but what it is we don't know. The Black Death? Have you ever heard of it, Aurelius?"

Aurelius shook his head and each of the other officers confessed their ignorance.

"He was hard hit," said James. "He might well have been delirious; few men retain a clear head to the end. But the rest of his speech was connected and sensible enough—there was fierce urgency in his voice!—I wonder if Lothaire's men are going to try some new kind of gas on us."

After much questioning, an officer from the chemical-warfare division recollected that there was a form of gas called the Black Death. And so was Ross' attempted warning misinterpreted. It was decided that the only thing to do was to double the number of sentries and increase the air-patrol, and then await events with what equanimity they could. Ships were sent out on every side of the city for many miles in order to guard against an air surprise. Gas-masks were made ready. A sense of uneasiness was felt by the officers, and from them spread to the men and to the civilian inhabitants of the city. Every one was looking for they knew not what. The sentries were nervous that night, with a tendency to shoot at any shadow that moved, and several false alarms occurred.

After being awakened by these alarms, several times during the night, James slept soundly until the next

morning, when he was awakened by Andreas, who informed him that the Master-Health-Controller of the city was waiting to see him.

WHEN the man was admitted and given permission to speak, he gave the Prince startling news. "Prince," he said, "some new and terrible disease has broken out in the city. Neither I nor any of my assistants have ever seen anything like it before. The first case was reported early this morning. Since that time there have been almost two hundred others. It is spreading at an alarming rate and seems to have broken out simultaneously in different quarters of the city. There are no deaths yet, but all the cases are getting worse rapidly. We know nothing about treating such a disease. If I might hazard an opinion, it looks to me like one of the contagious germ diseases that the health service wiped out thousands of years ago."

James was startled and alarmed. Could this have been the danger against which the man was sent to warn him?

"What precautions have you taken?" he asked. "We have segregated the cases in the hospitals," was the answer. "We are watching them closely. That is all we know how to do at present."

"Continue that policy," said James. "Watch each case closely. Let the matter be kept as quiet as possible. The disease may die out as rapidly as it started, and we don't want a panic among the townspeople on our hands now. Send for all your best assistants and see what they think about it. I will order skilled doctors sent from Orleans and all the nearby cities. They may know more about it than we do."

The Health-Controller shook his head doubtfully. "All the best doctors are in the Scientific Kingdom or on the side of the Plutocracy," he said dejectedly.

By that night the number of cases had increased to two thousand, and many of these were already desperately sick. The disease began with headache, giddiness and slight fever. After that, the patient invariably grew rapidly worse. His eyes were affected so that light caused intense pain. There was pain in the back and legs. The next stage was either apathy or delirium. The body became covered with dark red spots. The eyes were inflamed and the tongue became coated. The lymph glands in the body became swollen.

That night the first deaths occurred; and the disease was found among the troops and upper-class townsmen, too.

And then, that night, the guards caught a man in the very act of freeing sick rats from his bag. Doctors worked in their laboratories from the moment of the capture, and by morning announced that they had discovered the same small sausage-like germ in the rats that they found in the bodies of the men who had died of the disease. They continued to work in the hope of finding a vaccine or anti-toxin for the disease. The next day rumors as to the capture of the man and the cause for the sudden appearance of the disease spread among the townspeople. They rushed the prison in which he was confined and all but tore him to pieces.

By the second day of the plague, the number of cases had increased to four thousand and there had been about eight hundred deaths. Thus far, no one, once stricken with the disease, had recovered. Panic was beginning to spread among the civilians and many of

them were leaving the city. On the second night, James gave the guards strict instructions to take all those suspected of trying to spread the disease alive and bring them to him for questioning. Two men were arrested, but before the police could bring them to James' headquarters, mobs formed, and, despite everything the guards could do, killed them. The fear and rage of the people were beginning to spread to the newly organized troops.

On the third day news of the outbreak of the disease in other cities held by James' faction was brought in. It was also on this day that the doctors, nurses and health-officers began to die. They had boldly exposed themselves, while caring for the sick and in studying the disease, and about one-half of them were laid down by it.

James was here, there, and everywhere in the city, encouraging the soldiers and civilians, and fighting the disease.

The doctors, having finally realized that it was spread by the rats, mice, and fleas, started a campaign to exterminate these carriers. The cellars of old houses were pumped full of poisonous gas and rats and mice were killed in their holes. The doctors were provided with vermin-proof clothing. The slaves were routed out of their barracks, which were full of vermin, and camped in the parks under tents. In spite of these steps, the number of cases increased to ten thousand by the end of the third day.

It was on the morning of the fourth day that the government began to break down. There were now thirty thousand cases and over ten thousand deaths. The hospitals were long since filled. Two-thirds of the health-officers and doctors were dead. To save the situation James declared martial law and had his troops perform the offices of the civil government. The soldiers were ordered to discover all new cases as quickly as possible and bring them to improvised hospitals. To make places for them, all kinds of public buildings were turned into hospital wards. Theatres, town-halls, everything was quickly commandeered, and as quickly filled with plague cases.

But there was no let-up in the spread of the Black Death. One hundred and ten thousand cases were announced on the fifth day, and there were probably a number of others that went unnoticed in the general confusion. Occasionally, a man would drop dead in the streets.

Many doctors died at their benches in the laboratories, working faithfully to find a cure for the dread germ-disease to the last. It was on this day that a few of those who had contracted the plague early began to show signs of recovery, but when the percentage was calculated, it was found that less than 2 per cent recovered. By this time, it was discovered that the disease was taking three forms. The first was the ordinary form first described, but a later form appeared somewhat like a case of pneumonia. The germs attacked the lungs instead of the lymphatic system. This was even more deadly than the usual form. Difficult breathing soon appeared, followed by coughing, expectoration, and collapse of the lungs. There were no recoveries from this form of the plague. The third form was marked by septicemia (blood-poisoning). It usually resulted in prostration and death, sometimes causing insanity first.

A RIGID quarantine had been established over the city to prevent the people from spreading the disease to other places. Troops that guarded the city boundaries, air and land terminals, shot anyone who tried to leave without a permit. In spite of this drastic action, the fear-crazed people attempted to escape in large numbers. The guards were rushed at times, and large numbers of the inhabitants escaped into the open plains and to nearby cities. They almost invariably carried the Black Death with them, and soon the smaller cities of the southern provinces (which had not been considered large enough to warrant attention by Lothaire's Secret Agents) refused to allow fugitives from the larger cities to enter. The plague had not developed as rapidly in any of the other cities as it had in Lavan, but its presence was felt in all of them except Orleans.

There, warned by messages of the way in which the plague was being spread, the police had patrolled the city constantly and caught ten men who were carrying infected rats and mice. These men had all been shot the next morning. Their fate had apparently prevented further attempts.

But the situation in Lavan grew steadily worse. On the sixth day there were over two hundred thousand cases out of a population of less than a million. After that little attempt was made to keep a record of new cases. Deaths were occurring at the rate of five thousand an hour. It was estimated that one-tenth of the army now had the disease. All available hospital space was used up. The whole of James' skill and power of leadership were hardly sufficient to induce the half-crazed people and the raw recruits to bury the dead and give some kind of care to the living. Had Lothaire and the Myrmidons attacked at this time, there could have been no resistance. They did not attack, however, preferring to wait at a distance to allow the plague to perform its work.

On the afternoon of this day Avicé arrived from Orleans with a number of the best doctors that could be obtained. James had given strict orders that she was on no account to come to Lavan, but she calmly disregarded this.

"My place is by my husband's side at such a time," she said proudly. "What would our people think of me if I remained safely hidden in Orleans while they were dying like flies here?"

Her presence and that of the new medical staff put new heart into the people. She herself went into the hospitals and helped with the cases, showing the same high courage that enabled her to oppose Lothaire.

The new medical staff, however, was very pessimistic. A few of them were able scientists, being the heads of their departments in many of the small, semi-independent principalities that had joined James in revolt against the ever-growing Plutocracy. These men soon identified the disease and told James frankly that practically the only hope of stopping its progress lay in discovering an anti-toxin and vaccine. Nor did they believe that such remedies could be discovered in time to be of any use. They knew that these remedies existed in the Scientific Kingdom, but to apply there for aid was, of course, more than useless.

The doctors' fears were realized. On the seventh day there was an enormous increase in the number of cases. The deaths mounted to ten thousand an hour. Half the

army was said to be affected. People died in the streets and frequently their bodies remained there. The mortality among the persons tending the sick had increased to such an extent that no one would volunteer for new cases and many of them went untended. Robbery and looting went on among the scenes of death and misery. There were rumors of nurses killing their patients in order to be relieved of the dangerous task of caring for them.

James, who had been practically without sleep for the last six days, felt that the end had come. The city was a bedlam. Never was he to forget the sights he saw as he moved through the streets. Many of the people, crazed by fear and grief, wandered about screaming and adding to the terror of those that still retained some measure of self-possession. Discipline in the army was gradually dissolving. In vain did James and his officers go among them, telling them that the plague must soon end, and attempting to encourage them. They were convinced that the plague would end only when no victims remained. Words of encouragement were interrupted by shrieks from the sick and dying.

Terribly discouraged, James returned to his quarters to find Avicé ill. She, knowing how he would suffer, attempted to conceal her illness from him, with the plea that it was "only a slight headache."

But James was not to be deceived. He summoned the best physicians and had a test made. The result showed the plague germ in Avicé's blood.

James relapsed into dumb despair. His beautiful wife was stricken with the plague. He did not deceive himself. She would die, as half the city outside had died, and were still dying. Desperately he looked at her. He knew how the plague could change that beautiful skin, and eyes, and hair. In five days—. He shuddered, as he recalled some of the bodies he had seen.

Suddenly the courage that exhaustion and horror had robbed him of rose again. It must not be. He clenched his hands until the muscles in them stood out like cords. His jaw set like iron.

He motioned the doctor into the next room.

"Doctor," he said quietly, "did you say that there is an anti-toxin and a vaccine for this disease in the Scientific Kingdom?"

The physician nodded.

"Could you apply the remedy if it were here?" asked James.

Again the physician nodded. "In the Scientific Kingdom, full directions and formulas for producing both the anti-toxin and the vaccine are available. I was trained there and I have seen them. If we had these vaccines and anti-toxins we could save the whole city within two days."

"Then will I go for them," James announced grimly.

Aurelius, who had been standing quietly by the door, now spoke up, "And the whole air-fleet shall go with you! Better to die fighting than to die of plague."

James shook his head determinedly. "No," he ordered. "By myself I have one chance in a thousand of getting through. You know how the Kingdom is defended, Aurelius. With a fleet, even that one chance would be gone."

He turned back and put his hand on Aurelius' shoulder. "But," he said, "were it not for Avicé, I would ask you to come with me, old friend, so that we might

return or die together. But now I ask you to stay and protect the Princess. The city is in a wild condition, and she may have need of guards before I return."

Aurelius said quietly, "You will find the Princess safe, or you will find me dead, Prince."

James turned away hurriedly and made for the roof of the building. Once there he removed from its hangar a small, two-man glider, the fastest ship in the city. The gliders were so called because of their ability to make use of favoring winds and ascending air currents. But they also possessed powerful motors and because of their lighter construction were frequently faster than the larger ships. James took his seat at the controls. There was a sound behind him as he pulled off, but he did not turn to investigate the cause until he was well away. Then he saw the giant form of the faithful Andreas on the seat behind him. He thought of going back to drop him, but thought better of it. His great strength might be useful later. As the ship left the city it passed low over one of the parks in which the slaves had been quartered. Screams of grief and fear floated upward to them, and there was the stench of decaying bodies that had been left unburied. James increased their speed and the plague-ridden city dropped behind like a shadow.

Suffering with loss of sleep and wild with grief at Avic's illness, James had left without any clear plan of action for his arrival at the Scientific Kingdom. Like most of the other nobles of the Plutocracy, James had attended a military school where the fortifications of the Scientific Kingdom had been studied as models of perfection, so he knew something of the difficulty of the task before him. Gradually the night air began to clear his head. If he was to have the slightest chance of success, he would need all his wits about him. He thought hard while his ship sped northward.

TWO hours after sunset they were approaching the Scientific Kingdom. James could be sure of its presence ahead by means of the instruments which showed the presence of the strong electro-magnetic field that surrounded it. Not daring to enter this field and thus expose his presence, he cruised back and forth along its edge. The ramparts of the Kingdom were totally invisible, totally obscured by night and fog. A heavy thunder-storm was brewing in the west. As the storm slowly moved toward them, the night grew thick enough to cut with a knife. Suddenly the sky was illuminated by a streamer of lightning from the zenith to the horizon. An ear-splitting clap of thunder followed without appreciable interval. A moment later rain was falling in torrents. Then the lightning flashed again and broke into almost continuous display. Andreas crouched, frightened, in the shelter of his windscreens. There was danger enough in the lightning, as both he and James knew. Many ships had been destroyed and their pilots killed in thunder-storms. The metal construction acted on the lightning like a magnet on iron filings.

James glanced at his electrical compass and saw that it was out of order, having been affected by the powerful electrical display of the heavens. As the significance of the fact struck him, he gave a shout of joy. A moment later the ship was climbing with all possible speed. This continued until the lightning was flashing below them, and they were shivering in the low tem-

peratures and thin air of the higher altitudes. Then James headed straight for the Kingdom. He reasoned that if the storm put his electrical equipment out of order, it would undoubtedly have done the same to that of the Kingdom, and his approach would go undetected.

When, as nearly as he could estimate, he was over the center of the Kingdom, he dropped the ship again. Descending through the storm, they rapidly neared the earth. Through the blinding rain, James made out the form and lights of a tall building. Silently as ghosts they came to rest on its roof. With water streaming from their garments, they ranged backward and forward across the roof searching for some means of entry. James stumbled against a trap-door. Quickly he tried to raise it. It was locked. Andreas bent over it, caught a firm hold, braced himself against the roof, and surged upward. The trap rose with a grating sound. The space below was dark, but James felt a ladder and descended unhesitatingly. Andreas followed. A moment later they stood behind a curtained door that opened on what was evidently the main hallway of the top story of the building. The hallway was well lighted. Occasionally men and women moved along it. Most of them were dressed in the simple, loose hanging tunic that was the ordinary dress of the students in the Scientific Kingdom. A few of them, however, wore the enveloping and concealing costume of the bacteriology workers. Presently two of the bacteriological workers appeared in the hall. When they passed the curtained door, two pairs of strong arms reached forth and grasped each by the throat. A moment later they were drawn behind the door. Andreas coolly choked his victim, and then, on James' whispered command, helped to bind the arms and legs of the other. They gagged him and tied him to the foot of the ladder, after taking his costume from him.

Not five minutes passed before two bacteriologists, apparently, emerged from the doorway. Andreas' great bulk stretched his costume somewhat, but James' fit him very well. They wandered around the upper stories of the building for some time in the hope of coming on a clue that would direct them in their search. Occasionally they passed an open door that gave a glimpse of strange apparatus and busy students and teachers within. Most of the rooms, however, only showed students "reading" with the same kind of instrument strapped on their heads that had been used by the Director.

Finally, just as they were approaching a door, it opened and a man stepped out. He spoke over his shoulder to someone in the room, "I will see the Director about it at once."

James was quick to grasp this opportunity. "We must follow him," he whispered. "We can probably find what we want in the Director's office."

The man walked rapidly down the hall and entered an express elevator. James and Andreas boldly followed. No attention was paid to them. When their unknowing guide left the elevator, they followed several steps behind. A few minutes later he spoke to a guard stationed before the door and entered the oval room, which was the Director's office. James and Andreas remained in the hall until they saw him returning; evidently he was headed for the top of the building.

Then James approached the guard and said quietly, "We are from the bacteriology department. We want to see the Director at once."

"Go in," the guard told him. "Orders are to admit all bacteriologists as long as the great experiment is in progress."

James' face set like steel behind his mask. It did not take much imagination to guess what was meant by "the great experiment."

He and Andreas entered and closed the door behind them. The Director was alone in the room. He looked up irritably as they entered. It was later than his usual hours of work.

"Who are you? And what do you want?" he snapped.

"I have come with news of the great experiment," James replied in a terrible voice, and grasped him around the throat. Andreas caught his wrist to prevent him from touching any of the signaling devices on the table. A moment later they had him gagged and trussed up on the same metal couch to which the Kondo had been fastened a few days earlier.

James rapidly searched the office for any information that might be of value, while Andreas amused himself by frightening the Director with his dagger. The Director showed a woeful lack of that quality that he had disparaged when he talked to Lothaire ten days earlier. Andreas would sweep his dagger around the man's head as though he were going to sever it from his body at one stroke. Then he would let the point rest gently over his heart. The Director followed each movement of the glittering steel with terror-stricken eyes.

ON a table against the wall James saw several glass jars surrounded by electric-heating coils; but on examination they all showed the labels of bacteria widely different from the plague germ. His eyes searched the room and he noticed the thousands of wall-sockets and the device for "reading." He was familiar with this and paid little attention to any of them, until he noticed a similar set of sockets on another portion of the wall with another set of head-phones and eye-pieces. He pounced on this with an exclamation of pleasure, and adjusting it over his head, connected it with one of the sockets. Just as he had thought; it was a device for seeing and hearing everything that went on in the building. It was known as a phomoscope. A mouthpiece provided a means of communicating with the places seen and heard through the eye and ear-pieces. Each socket connected with a separate part of the building, and the ear-phones brought all the sounds to the ear while the eye-pieces allowed a complete vision, just as though one were standing behind one of the walls of the room watching and listening to its occupants. He tried over a hundred different sockets before he found one at which he paused. The others brought him glimpses of classrooms, physical and chemical laboratories; of a room in which fifteen or twenty men and women were confined in a metal cage; a glimpse of a room in which he saw a group of rats made ready for the inoculation of the dread disease. On these he did not pause, but presently he came to a room where several men, dressed like himself, were bending over the figure of a naked man lying on a couch. The man was very sick. The others were evidently doctors watching the case. One of them was speaking.

"This man," he was saying, "has a severe case of the plague. The case was purposely initiated about ten days ago for experimental purposes. Except for occa-

sional small doses of anti-toxin, he would have died several days ago. I will now demonstrate the powers of the anti-toxin by effecting a complete cure.

"As you know, or as you should know, if your instructors have been as efficient as they are supposed to be, most of the injurious effects of a germ disease are caused by a poison or toxin given off by the germ either while it is still alive or on its death. This poison destroys the body tissue. If a sufficient number of germs are present, there is such destruction of tissue as to cause death. In most diseases some particular organ or section of the body is the special subject of attack, and death is caused by rendering this organ ineffective. It was long ago discovered that the poisons or toxins of most germs could be neutralized and rendered harmless by substances called anti-toxins. These anti-toxins were first prepared from the serums of animals that had been infected by the disease. Thus a horse would be given a particular disease, say what was formerly known as diphtheria. Diphtheria is almost never deadly to horses, and some days after infection, serum (a preparation made from the blood after coagulation) could be taken from the horse. It was found that if this serum was injected into the human body, it would cure diphtheria. In other words, the contraction of the disease by the horse caused some natural substance to appear in his blood, which prevented the disease from being harmful to him. Nature caused the horse to manufacture his own anti-toxin, and this substance remained in serum prepared from the horse's blood for an indefinite time. Originally, anti-toxin could only be prepared by infecting some animal with the disease for which one wished an anti-toxin. Today we can produce this anti-toxin chemically just as we now produce our food chemically, instead of waiting for sunlight, plants, and animals to do it for us. The formula for producing an anti-toxin for D-4001 is very simple. I have in this vial," the speaker raised a glass bottle with a label on it, "enough anti-toxin to cure a dozen cases. The directions and formula are written on the label. Were this bottle to fall into the hands of the revolutionists, they would be able to cure practically every case of the plague."

James, listening intently, smiled grimly when he heard this remark.

For a moment the doctor was silent and James saw him fill a hypodermic syringe from the bottle. This was injected into the arm of the prostrate man. Removing a thermometer from his mouth, the physician announced that he had a fever of 107 degrees. His eyes were glazed, and the dark red spots that were indicative of the disease covered his skin. At the injection, he moaned slightly but did not move otherwise.

The physician continued, "In a few days this man will have completely recovered. Possibly the dose will need to be repeated once or twice, but that is all.

"Now the vaccine is entirely different from the anti-toxin," the speaker crossed the room and held up another bottle of what appeared to be a clear fluid. "The purpose of the vaccine is to prevent, not to cure the disease. It consists of dead or weakened germs in solution and is injected into persons exposed to the disease. It produces a very mild case and renders the person vaccinated immune for a longer or shorter period. In the case of D-4001, the immunity continues for many years. Full directions for preparing and administering the vaccine are also to be found on the label—"

James waited for no more. He approached the Director and removed the gag from his mouth. While Andreas held his dagger against his throat, James connected the mouthpiece, which he had not used formerly, and ordered the Director to have the vaccine and anti-toxin brought to his office. The Director glanced into the instrument, shuddered as Andreas pressed the dagger closer to his throat, and then spoke, "Vardas, bring the vaccine and anti-toxin to my office."

"And come alone," prompted James, while Andreas pressed the dagger a little harder.

"And come alone," repeated the Director in a frightened voice.

James, looking through the phomoscope, saw the doctor gather up the desired objects and leave the room. Apparently nothing wrong was suspected. The Director was gagged again, and James and Andreas took up positions on opposite sides of the door.

Everything went smoothly. Vardas entered a few minutes later, and at almost the same time James removed the precious vials from his hands. Simultaneously, Andreas also struck him over the head with the leg of a chair and he dropped to the floor without a sound.

Now came the problem of escape from the Scientific Kingdom. One of the views that James had obtained through the phomoscope had shown that the storm outside had disappeared, leaving a clear night. He had no intention of waiting for another storm to come up and release him. He thought for a moment, and then connected the phomoscope with the commander of the guards. Using the dagger as a means of persuasion, he forced the Director to give orders that the ship which was to leave the Kingdom in a few minutes was not to be fired on.

Next he opened the door by which they had entered and glanced into the corridor. Everything was quiet. The guard stood with his back toward him. He closed it again and turned to tell Andreas to come with him. But Andreas was busy with a plan of his own. He was filling a syringe from the bacteria cultures on the table. Before James could stop him, he had injected this into the arm of the Director. Having done so, he filled the syringe again, from a different culture, and injected it into the Master-Bacteriologist. James moved to stop him but a vision of the plague-ridden city he had left came before his eyes and his mouth hardened. "Let them have a taste of their own medicine," he thought grimly.

Andreas' simple mind showed a logical thoroughness. He injected some of *all* the bacteria in the room into both men.

"Now," he said, "let their doctors develop a cure for that!"

A moment later they left the room, telling the guard that the Director did not wish to be disturbed again that night. Transported to the top floor of the building in the elevator, they soon found the door by which they had entered. The man they had fastened to the ladder was still there. James mounted the ladder and peered out on the roof. Except for the dark shape of their glider, it was empty.

Three hours later they were back in Lavan. James rushed in to see Avice. Her beautiful features were flushed with fever and it was clear that she was much worse. Quickly he summoned the doctors, and the anti-

toxin was administered. Through the night he watched by her side; by morning it was apparent that she was better.

Using the formulas, the doctors worked continuously to produce the vaccine and anti-toxin in large quantities. On the next day, they were administering the anti-toxin throughout the city. The vaccine took longer to prepare and to have its effect, but in a few days this, too, was being used broadcast on the army and townspeople. The progress of the plague came to an abrupt stop. Practically all the cases treated with anti-toxin recovered, and the vaccine prevented the appearance of new cases. The formulas were sent by radio to all the other cities where the plague had begun, and they, too, were saved. It was fully time. In Lavan alone there had been over seven hundred thousand deaths. It was estimated that the plague had killed over three millions in all the country since its start nine days before.

During the week following his return from the Scientific Kingdom, James divided his attention between Avice, who was rapidly recovering, and his efforts to put the city into a state of defense against the attack he momentarily expected from Lothaire and the Myrmidons of the Plutocracy. It was not until much later that he learned why they did not attack during this period of comparative helplessness. Lothaire was still ill as a result of his wound. His exertion had made him decidedly worse, and with his firm hand lifted from the reins of government, the affairs of the Oligarchy were badly disorganized. Then, too, it was several days before they realized that a remedy for the plague had been found. Many of the Plutocracy's Secret Agents had been prevented from communicating with their masters. In the Scientific Kingdom, it was not clearly known who were the persons who took the vaccine. No one had been known to enter there without the full knowledge and permission of the authorities for thousands of years, and it was thought that it had probably been some of the students in disguise who had caused the scene. It was the morning after James' visit before the Director and the Master-Bacteriologist were discovered, and then they were far too ill to tell anything of what had happened. The most skillful doctors worked over them for days before there was any sign of improvement.

DURING this respite, the cause of the revolution went rapidly forward. The army was reorganized. Crews were trained for the Air Navy. A month passed and the losses caused by the plague were more than filled up. James estimated that there were not more than two million of the Myrmidons in the country, and his army was now almost double that. He knew that it would be necessary for his raw recruits to outnumber the Myrmidons in order to defeat them. For the Myrmidons were professional soldiers, perfectly armed, trained to the highest peak of perfection, with a corps-morale and professional pride that was at least the equivalent of a direct interest in the outcome of their struggle. They were officered by the nobles of the country, men before whom it was disgrace to show fear of any kind. Such enemies were defeated only with extermination.

One morning the guard announced to James that a strange man desired to see him on urgent business. When he was admitted, James was surprised to see that it was Ross, the member of the Black Groups who had aided

his escape from the Hall of Plutus and the City of the Wheel.

Before he could speak, Ross asked, "are you Prince James?"

For a moment James did not understand Ross' failure to remember him. Then he realized that Ross was pretending not to recognize him, because he did not wish to be recognized himself for some reason. James nodded and said, "Yes. Who are you? And what do you want?"

"A private audience, please, Prince," was the answer.

James ordered everyone from the room and closed the door himself.

When they were alone, Ross continued, "I beg your pardon, Prince, for precautions that may be needless, but it is of the utmost importance that no one should know who I am. You know something of the history of our organization. It was founded many years ago by an ardent patriot to curb the power of the oligarchy and protect the rights of the people. We have been forced to work through assassination and bloodshed. These are the only arguments that the oligarchy can understand. Whenever one of their rulers is more tyrannical than usual, we warn him; then, if he persists, we condemn him to death, and have him executed by one of our number. Lothaire has been under sentence of death by us for a long time. Many of our men died in attempts to carry out that sentence. I myself failed in an attempt to kill him, only because of his presence of mind in taking an antidote for the poisoned bullet. Where I failed, I or another will sooner or later succeed. But enough of that for the present——"

Ross nervously walked across the room and listened at the door.

"I thought I saw the knob turn," he explained, "but it was nothing. Having done so much listening at doors myself, I naturally suspect others of the same thing. Then, too, I know that you are surrounded by spies of the Plutocracy. It was they who killed the messenger I sent to warn you of the Black Death. I received that information from a slave in Lothaire's retinue. My part in your escape from the Hall of Plutus is unknown and I still stand well in Lothaire's opinion. If any of his spies should see me here, it would mean a horrible death for me when I return."

He looked around the room uneasily, and then, apparently reassured, continued, "I have been sent to you today as a representative of our organization. Lothaire has practically recovered from his wound. The Myrmidons are massed in the City of the Wheel, ready to leave with the air-transport to attack you as soon as the command is given. The trip can be made in five hours or less. You have done wonders with your men, but it is doubtful if they could withstand attack by seasoned veterans as yet. Raw troops are always better on the offense than the defense."

He spoke rapidly and excitedly now. "What if you strike first, Prince?" he said. "We have prepared the way for you. The City of the Wheel has a population of about forty million. Over half of these are industrial slaves, owned by the government, and quartered in the slave-barracks and ghettos on the north side of the city. They work in the great food factories. You know how they are treated! Our agents have been among them and they are ripe for revolt. What if at the same mo-

ment that you attack the city from the air, they keep the Myrmidons busy below? The nobles and their servants will be the only part of the population that will oppose you. They, together with the Myrmidons, will number less than three millions. The city is poorly equipped to withstand an air attack. There has been no need for fortification in the past. It would be strange if we could not win with a combined attack."

James agreed the plan seemed a wise one, and Ross continued, leaning forward in his excitement. "The capture of the Capital will settle the civil war with one battle. You will win decisively at a stroke!"

James called in several of his officers, and after a council of war, the matter was arranged as Ross suggested. When James and his army embarked for the City of the Wheel, they were to send a certain series of radio signals. Precisely five hours after this signal was sent, the slaves in the City of the Wheel would revolt. The interval was just sufficient to allow the army to traverse the distance between Lavan and the City of the Wheel. In order to preserve the secrecy of the attack it was agreed that this was to be the only signal interchanged, and that there was to be no change of plan once it had been sent.

When Ross left after completing these arrangements, James, as a special mark of courtesy, walked to the door with him. Later he remembered that the door, although it had been carefully closed, was on a slight crack. He looked keenly at the guard who was stationed outside. His face showed nothing. He was a handsome enough young man, who had distinguished himself during the plague epidemic by the fearlessness with which he had gone among the victims. Apparently he had borne a charmed life, for though he worked among the Black Death cases continuously, he did not contract the disease.

James considered this fact as food for thought. Then he considered his conversation with Ross. It was vitally important that the code signal should not have been overheard. He summoned Aurelius and ordered him to keep the guard continually in sight.

"And in particular," he added, "don't let him get to any of the radio-sending stations."

The rest of the day James spent in preparing the army for the attack on the Capital, the City of the Wheel. Finally, he decided that they would be ready to leave the next day. Speed was necessary for the attack.

HE worked late into the night to make the necessary preparations. It was almost one o'clock when he finally went to get a few hours sleep. He had stationed the same guard outside his door in order to enable Aurelius to keep him under surveillance more easily. Just as he was dropping off to sleep, he thought he heard the sound of a struggle in the hall. Grasping his sword, he rushed to the door. Aurelius lay senseless on the floor and the guard had disappeared. For a moment he hesitated and then heard the sound of running feet over his head. This was followed by the fall of some heavy body and the slamming of a door. There, above him, was the radio-station. He dashed up the stairs. The guard before the door of the radio-room was dead and the door was locked. He hurled himself against it and forced it open. Inside he could hear the guard sending the code signal that Ross had given. In a moment the door yielded and James was in the room. The guard had already sent the code signal and was

now trying to communicate with a station of the Plutocracy. As James entered, he rose, sword in hand, to defend himself.

The fellow was an accomplished swordsman, but such was James' rage, that he felt that he could have accounted for a thousand. There were a few quick thrusts, a lightning-like riposte, a feint, and then James' blade went home. The guard fell to the floor, but the mischief was done.

A moment later Aurelius, who had only been stunned, entered and told how the guard had escaped him. James thought rapidly. It was then two o'clock. In five hours, or at seven in the morning, the slave revolt would begin in the City of the Wheel. And his army would not be there. He turned to Aurelius.

"Rouse the troops at once. You should be able to embark in two hours. Then order the transports to proceed at full speed to the Capital. I'll go ahead and try to hold up the slaves' revolt until you arrive."

Aurelius left the room to carry out the order and James dashed for the roof. A few minutes later he was speeding northward in the same glider in which he had visited the Scientific Kingdom. He geared the motors to their maximum speed and tore through the night. If the slaves' revolt occurred before his troops arrived, the Myrmidons would undoubtedly crush it, and then turn their full force on his arriving and disorganized recruits. He *must* stop it. Anxiously, he worked with the motors to increase their already terrific speed. He glanced at the air-speed indicator. Ah! At that rate he should reach the Capital in four hours or less.

An hour passed and James began to feel better. At his present speed he would have more than an hour to find Ross and delay the outbreak of the revolt. Then the over-strained motors began to fail. They continued at reduced speed for a moment; then stopped altogether. He landed in the open country and feverishly examined them. He found the trouble soon enough. The high speed had worn the threads on one of the valve shafts. The only thing to do was to change the shaft. It was fully an hour's work. And once, during this time, he was forced to stop and shoot a lynx that was stalking him. This uninhabited country was full of wild animals. Finally, he was off again.

It was almost seven when he approached the City of the Wheel. By showing the flag used on the official ships of the officers of Myrmidons, with which he had equipped himself, he was allowed to enter the city without question. He headed straight toward the slave-barracks on the northern side of the town. He was still over a mile away when he realized that he was too late. Precisely at seven, there were a series of explosions in various parts of the town. Later he learned that these were caused by the Black Groups blowing up police stations, munition store-houses, and radio-stations. A moment later a squadron of police ships roared over his head. Not wishing to be questioned by them, he landed his plane on the roof of a low building that was on a wide street leading from the slave-barracks. He could hear shots in that direction, and presently, there was a plume of smoke that indicated that the buildings were being fired.

In a few minutes he heard the murmur of a great crowd in the distance. The slaves were coming! Later, from Ross, he was to hear how they had caught their guards by surprise, armed themselves with their weap-

ons, and then headed for the city. It was all done in a few minutes. Due to the perfection of the Black Group's work in blowing up all means of communication in the city, the police and Myrmidons did not at first know what was happening. Sabotage had disabled many of their air-craft, and they were hampered in every possible way.

The murmur grew to a roar and James saw a dark mass moving along the street in his direction. As it drew nearer, it resolved itself into a river of human beings that flowed along the wide street. On looking to the east and west, he saw that all the streets leading from the slave-barracks were filled with this human sea. Twenty million slaves were out to seek vengeance for generations of horrible oppression. Worked to the limit of endurance, and beyond, from the cradle to the grave, these people had nothing to lose. Death would only free them from their toil. And to gain! Ah! to glut their desire for vengeance once before they died! To the south and east were the palatial homes of the nobles. If they once got among those beautiful grounds and homes, they would wreak vengeance indeed.

Now they were passing below him and James could make out individuals in the mass. Dirty, bent with toil, faces of unrelieved bestiality, armed with any weapons they could lay their hands on, knives, sticks, hatchets, steel rods, pieces of machinery of every description; jumping, leaping, screaming, they swept on in a horde of immeasurable vitality. Men and women both, dressed in rags, faces that showed no traces of the human, only a superhuman lust for blood. By mere force of numbers and intensity of hate it seemed that they would sweep the town before them—that buildings, guards, walls, people, everything, must go down before this flood of vengeful humanity. The same force that had created the marvelous beauty of the city during a period of hundreds of years was now loosed to destroy it in as many minutes.

THE mob looted as it came on. This was the business section of the city and they tore open shops, stores, and every place that seemed to offer hopes of loot or weapons. There were wine and liquor dealers' shops along the street. The mob emerged from their bottle in hand, drinking as they came. Isolated policemen, stationed in the district, shop-keepers, clerks, and all, ran for their lives before the advancing horde. Some of them were overtaken. There was a little flurry of rising and falling arms as the mob swept on, and then everything was quiet. There was blood on many of the weapons.

The sound of the multitude was indescribable. They seemed to fill the northern part of the city like an ocean. And their advance was as resistless as that of an incoming tidal wave. Twenty million strong, the flood rolled on!

But now the defense was gathering. Armored cars swept toward the mob from the south and east. The camp of the Myrmidons was awake. On the street below him, James saw a squadron of armored cars draw up, perhaps a hundred yards from the mob. Soldiers leapt out, fifty or sixty of them. Machine guns were placed in position across the street. Riflemen fired from between the cars, but the feeble cracks of their weapons showed the futility of trying to stop the mob by such means.

The horde swept on. Now they were within twenty feet of the soldiers. For a moment James thought the Myrmidons had made a mistake and not given themselves time to prepare the machine-guns for action. Fifteen feet now. And what seemed to be an almost solid wall of flame swept out from the armored cars and the barricade! The head of the mob melted before it like wax in a draft from a blast furnace. The force of the rush carried dead bodies to the very verge of the barricade, but not a living man crossed it. Steadily, the firing continued, and the mob dropped in its tracks. The street was filled with bodies from side to side. And still the pressure from the rear continued. Hundreds and thousands died in the street but millions pressed on from behind. The bodies grew so thick that they formed a protection for those in the rear.

Similar scenes were being enacted in all the streets leading from the north. These streets were like the spokes of a great wheel, converging on the Temple of Plutus in the center of the city. Thus, as the middle of the city was neared, the streets were closer together. This concentrated the millions from the slave-barracks.

Guided by members of the Black Groups, disquised among them, the mob was now turning into the side streets to flank the machine-gun positions which they could not carry from in front. Others entered the buildings on either side of the streets and made their way to the roofs.

But the Myrmidons were strongly reinforced now. They, too, took possession of the buildings and climbed to the roofs. The chemical-warfare division turned gas on the horde. Due to the fact that most of the gas-producing equipment had been destroyed by the sabotage of the Black Groups, and due to a strong north wind which blew it back into the faces of the defenders, it was not very effective. But such air-craft as were in commission created great havoc among the slaves. They flew low over the streets with their rapid-fire guns singing a constant song of death, emphasized by the occasional explosion of bombs dropped in the mass. Larger craft carried small machine-gun divisions over the heads of the mob and landed them on the buildings on either side of the street. From these positions they kept up a continuous stream of fire on almost the whole body of the mob. Many of them paid for their temerity with their lives. The slaves, careless of death, entered the buildings and forced their way to the roofs recklessly charging the gunners. Whenever a gun was rushed, the gunners were either hurled over into the street or torn to pieces on the roof. The Myrmidons and their officers, however, fought with the utmost courage. James saw them calmly directing the fire of their guns, up to the very minute that the mob was upon them. To a man, they went down fighting.

Gradually the superior weapons and discipline of the Myrmidons began to win the advantage. Death was poured into the mob from in front, from every side street, and from above. Their dead filled the streets. After an hour's fighting James estimated that at least three millions of them were either dead or wounded. They were beginning to retreat toward the north again. Still the hail of death kept up. The retreat would soon become a rout unless some aid was forthcoming. Undisciplined men flee easily.

James entered his glider and flew low over a machine-gun position that was blocking the mob on his street.

He saw the Myrmidons drop like grain beneath the scythe of the reaper as he flew over them. Coolly he kept his bow-gun full on them. The mob turned back and rushed the position. He turned his ship and swept back along the street, cleaning out the machine-guns along the roofs of the buildings. They, taken by surprise, did not return his fire at first. The mob began to rally below him. But it was an isolated instance. Everywhere else they were in full retreat. And soon a dozen ships were after him. He turned, twisted, dived, and climbed. It was no use. A shell burst shortly in front of him. A moment later another struck the rear of the glider. It dropped like a stone; struck the edge of a building; toppled off; and fell toward the ground with terrific speed. A hundred feet below it struck a steeply slanting roof, almost came to a stop in a heavily built gutter, then fell over, struck the ground three hundred feet below and was smashed to small bits.

But James was not in it. When it had paused in the gutter he had fallen out. Bruised, bleeding from a cut on the head, but otherwise unhurt, he retained the presence of mind to lie still. The ship that had shot him down swooped over him to make sure that he was dead.

The pilot must have been sure that this was the case, but "just for luck" he sprayed the roof with machine-gun bullets. By a miracle, James was missed, and in a few seconds the ship was far away.

He rose on his elbow, as he lay in the gutter, and looked into the street below. It was a bloody shambles. The pavement was literally carpeted with the bodies of the slaves. The Myrmidons were advancing along it, killing as they came. The mob was in full retreat, pursued and fired on from flank, rear, and above.

James wiped his bloody forehead with his hand. His army was too late. When they arrived, the full force of the Myrmidons would be turned on them.

EXHAUSTED and partially dazed, he fell back into the gutter. Suddenly a high-pitched horn came to his ears. It grew to a mighty roar. A powerful air-fleet was approaching from the south. James was on his feet, yelling hysterically. He turned his eyes to the sky. It was his army that was coming! He knew those ships. There in the van was the mighty battleship *Diarmid*. And on the right was the *Invincible*; on the left, the *Iron King*. And there was the flagship, *The Loyola*, named in honor of Avice. On her decks would be Aurelius, Andreas, and all his well-beloved crew of fighting men! And behind them were the transports that carried his army. The officers and men that he himself had trained; men who would go through fire and water for him. Now the Myrmidons would meet foes worthy of their steel. No half-naked, untrained, unarmed sheep led to the slaughter were these men.

The Myrmidons saw these new foes and turned back to meet them. Their air-craft put up a savage defense, while ground batteries poured in a heavy fire. But now the advantage was with the attackers. The incomplete air-force of the Plutocracy was slowly being destroyed. The transports were landing their loads of infantry to the west of the town. The horde of slaves were turning back. As they had slaughtered the mob, now were the Myrmidons being slaughtered.

James watched *The Loyola* moving rapidly toward him in pursuit of one of the Plutocracy's ships. He stood up on the roof and waved frantically. He saw a

gunner on *The Loyola* aim at him; and then, an officer, looking through his glass, stopped the gunner. A moment later the ship was overhead. A glider took off from it and picked him up. He stood on the deck of his flagship. Barely taking time to wring Aurelius and Andreas by the hands, he commanded that the ship continue in the battle.

Now new enemies appeared on the scene. Lothaire, who had taken no part in the previous fighting, gathered around him all the ships of the Plutocracy not already engaged in the fighting, and approached from the camp of the Myrmidons. A desperate air-fight took place above the city, while the mob and the Myrmidons struggled below. James' ships sought desperately to close and board, while Lothaire's ships, being superior in gunnery, tried to continue the fight at a distance. In order not to be driven from above the city, Lothaire's fleet was finally forced to hand-to-hand fighting.

Lothaire's flagship was the *Plutus*, one of the most powerful in the country. All through the fight James tried to get his ship alongside of it. After taking a heavy punishment in shell and small-arm fire, their sides touched. Hooks were thrown over, and the ships made fast to each other. With a yelling, cheering, screaming, mass of his men at his back, James leapt on to the deck of the *Plutus*. Andreas charged beside him, and together they created havoc among the defending crew.

"Death to the Plutocracy! Down with the Oligarchy!" shouted James and struck down a Myrmidon with every shout. The force of the rush carried all before it for a time. James was leading his picked crew, which had formerly manned the *Mercury* and had been seasoned in many a fight against the Plutocracy. Nothing could withstand them. Aurelius, veteran of a dozen of the Plutocracy's wars, dealt death on one side, and Andreas' huge frame swept men away like pygmies on the other. The fight surged across the decks of the *Plutus*. The Myrmidons fought with the grim skill and determination of men that had made fighting their profession for life. For them death was better than defeat. Their officers, mostly nobles from the great houses of the Plutocracy, encouraged them by the most reckless exhibitions of courage.

Lothaire stood coolly on the quarter-deck, swinging an ivory inlaid cane, and directed the defense with the utmost skill. He ordered the defenders to give back slightly in the middle so that James' boarding party might be surrounded on three sides. But the encircling ring was too weak to hold these picked fighting men. They broke it in a dozen places. The defenders were divided into isolated groups and cut down separately. James' sword arm was displaying a wizardry that even he had hardly known he possessed. To get at Lothaire was his thought—to cross swords with the demon that he did not doubt was responsible for the plague! He cut right and left and called challenges to the Prince of the Plutocracy.

Lothaire's face darkened as the struggle went against his men. Now they were restricted to the quarter-deck, and James and Andreas were pushing them hard. The fight was all but over. Lothaire looked over the side. There, on the ground, the Myrmidons were making head against the slaves. They held almost the whole of the city now. If he could reach them, all was not lost yet. He slipped into a glider and prepared to drop over the side. Just before he did so, however, he drew a pistol

and took careful aim at James. If their leader were killed, it would be much easier to crush the insurrection. At almost point blank range he fired, and James dropped like a felled tree. The next instant Lothaire was over the side in a steep dive for the ground.

Andreas had seen Lothaire's purpose, however, and acting quickly, he had dragged James' feet from under him, throwing him to the floor just as the shot was fired. Owing to his presence of mind, they both rose unhurt.

Lothaire's flight ended the fighting on board the *Plutus*. Those of his followers who were fortunate enough to be able to do so, fled in other gliders. A few leapt overboard, dropping the thousand or more feet to the ground and to certain destruction, rather than surrender. A few threw down their arms in token of submission. The rest, by far the greater part, lay dead or wounded on the deck of the ship.

JAMES looked around him. Everywhere the fleet of the Plutocracy was suffering defeat. Some of their ships had been destroyed, others captured by boarding parties, a few were fleeing. Below, however, the battle was raging with desperate intensity. The Myrmidons had almost exterminated the slaves, when the troops that James' transports had landed to the west began to arrive on the scene. Coming up the long avenues, they were taking the places of the slaves and falling on the Myrmidons with terrific ferocity. Their war-cry, "For Prince James! For Prince James! Death to the Plutocracy!" floated up to his ears. They fought their way savagely along the streets and across the tops of the buildings. Machine-gun emplacements were either rushed or flanked as circumstances dictated. Blood now ran ankle deep in the streets, as the fighting continued across the dead bodies of slaves, Myrmidons and revolutionists alike. Then the fighting changed to hand-to-hand encounters. The slightly curved swords, suitable for either cutting or thrusting, with which James had armed his men, were doing yeoman service.

Yet the discipline and courage of the Myrmidons seemed a match for the ardor and fire of their attackers. If Lothaire had stood in the background before, he more than made up for it now. Convinced that without his aid and personal example his men would not survive the day, he stood in the front rank, fighting, as only he knew how to fight. Totally recovered from his wound, his sword arm wove a circle of death around him. It seemed that no one could stand against him and live. By his strategy, one of the advancing columns was taken in the flank by a side-street and began to recoil upon itself. His men, as well accustomed to fight as to breathe, charged shouting, "For Plutus and our Country! Death to Prince James!"

Soon the fighting, seething mass below was inextricably mingled. So confused were friend and foe that the air-fleet was forced to cease firing because of the danger of shooting their own men. Seeing this condition, James ordered his ship to land behind his lines and prepared to lead his army in person. His appearance gave his men renewed heart. Again they surged to the attack. The Myrmidons were swept back by the oncoming wave. Fighting stubbornly, they retreated slowly toward the center of the town and the Temple of Plutus. James and his men pressed savagely on their heels. The remnant of the slaves attacked again. Whenever possible the fleet poured in a hot fire from above. James

withdrew from the fight for a minute to signal the fleet to land behind the Myrmidons and have their crews attack from the rear, so as to surround them. This maneuver was carried out, and soon the Myrmidons were hemmed in on three sides, slowly retreating toward the Temple of Plutus. Each inch of the ground was savagely fought over, taken and re-taken many times. But always the advantage was with the attackers. With Aurelius leading the crews of the battle-ships against them on one side, and James and his army on the other, the Myrmidons were falling like leaves before a winter wind.

Suddenly, while he fought, James became conscious that Ross was plucking at his sleeve.

"Quick, Prince," he said. "Gather thirty or forty of your best men and come with me."

Knowing Ross too well to stop to ask questions, James did as he was requested. Ross led them back from the fighting and into a building on the street. There they descended to the cellar, and Ross, opening a cleverly concealed door, led them through a tunnel.

"This secret passage," he explained, "leads to the Temple of Plutus. The Myrmidons have mines planted below the streets, and as they retreat, and your men stand over them, they will be exploded unless we prevent it."

A few minutes later he stopped them.

"We are now under the Temple of Plutus," he said. "The wires for exploding the mines run into the Council Chamber. Always the Plutocracy has feared a slave revolt, and they have had these mines planted for years, so that they might blow up half the city at a moment's notice. The hall is poorly guarded, and if you can take it and hold it, the mines cannot be exploded."

A moment later James' men were pouring into the Council Chamber through a secret door. The great hall of fantastic and bizarre splendor was occupied by only ten men and an officer. They lounged around the room, while the officer, evidently a great noble, sat at the table. At the entrance of James and his men, they rose to their feet to make a savage defense. A few shots rang out, and then began a hand-to-hand struggle. There, at one end of the great hall, three of the revolutionists pursued a single Myrmidon around the statuary; at the other end, four Myrmidons stood back to back while a knot of James' men struck at them; in the center of the room, James, himself, pressed the officer back against the ebony table; in other parts of the room, others of James' men cut down the Myrmidons, either in groups or alone.

The battle did not last long. James' sword soon found the officer's heart. His men did not long outlive him. When the fight was over, James looked around him. There on the table was the key-board that would set off the mines. The officer had been reaching for the switch when the blade had pierced his body. Five of the attackers had been killed and three others wounded. James saw that it would be a slim force to hold the great room if they were attacked. He stationed half of his men at each of the doors, climbing the balcony himself in order to get a view from one of the concealed windows. Desperate fighting was still going on in the streets of the city, but everywhere the Myrmidons were retreating. Still, it might be hours before the attackers penetrated as far as this. Apparently the defending troops had not yet learned that their guards in the Council Hall had been attacked. James descended to the floor again. Sudden-

ly two messengers appeared in the corridor leading to one of the doors. They gave one look, and then turned and ran as fast as their feet could carry them. A scattering fire from James' men brought down one of them, but the other escaped.

"We will be attacked in five minutes," James said, coolly. "Ross, retrace your steps through the tunnel and bring all the available men you can get. We shall try to hold our own until you return."

A few minutes later a solid column of Myrmidons was attacking at each door. The fighting here was the most desperate that James was to witness during the day. His men knew that to retreat an inch would mean death for thousands, even millions, of their comrades. They stood in their place as immovable as rock. And all the more desperate grew the efforts of the Myrmidons to pass them. Sword rang on sword, with only an occasional shot. The press was too great to allow firearms to be used frequently. The defense faltered at one door and James rushed to its assistance. For a moment his sword wove such a circle around him that the Myrmidons gave back. At that moment Lothaire appeared at the far door. With a savage thrust of his sword, he disposed of one of the defenders and dashed through the opening. He was followed by his men. Seeing that further defense at the door was useless, James ran to protect the key-board that would set off the mines. His men retreated with him, forming a line of steel around the ebony table. In a moment James and Lothaire were opposite each other, blade against blade. Their weapons engaged with the purring rasp that marks the work of expert fencers. So fierce was the contest, that almost involuntarily, the other combatants on each side dropped their weapons to watch this conflict of masters. But only for a moment. An officer of Myrmidons shouted. "Press on, men. Take them on all sides!" And even while he fought, James saw his men slaughtered around him. So great was Lothaire's skill, that he could not spare a moment to aid them. Now his back was to the key-board and Lothaire's sword was weaving a circle of fire before his face. He felt a burning sensation in his arm and knew that he had been touched. Then he smiled with pleasure as his own weapon drew blood from Lothaire's shoulder. A moment later the man on his right fell and another hostile blade was added to Lothaire's.

He shouted a challenge to Lothaire, "Prince of the Plutocracy, let this dispute be settled between your blade and mine. Let the others cease fighting and abide the decision between us alone!"

Lothaire smiled coldly, and pressed harder with his blade as he answered. "So would I cry, too, were my men outnumbered here! No, we shall cut you down, Prince of the South, and your men shall die afterward, outside."

The defender on James' left fell, pierced by a dozen weapons, and now hostile blades were all around him. Bleeding from wounds all over his body, he still fought. But his arm was growing weaker. Through a haze of blood and mist he saw Lothaire's cruel smile growing broader. Ah! what was that? Was that Andreas' mighty form that had fallen on the rear of the attackers like a lion? Suddenly James became aware of his own men, pouring into the hall from the secret doorway. Andreas was by his side with a dozen more and the keyboard was safe once more.

Now the Myrmidons were being pressed back in every part of the hall. Lothaire withdrew a little toward the door. But always he returned to the attack with fresh troops. To James and his men this seemed to continue for hours. Back and forth across the great hall surged the tide of battle. As the Myrmidons were forced back into the streets of the city, they attacked with all the greater ferocity within. A dozen times did Lothaire perform prodigies of skill and valor only to be turned back by the stubborn defense led by the equally formidable James. The living now fought standing on the bodies of the slain. Blood mingled with the jewels in the Fountain of Wealth at the lower end of the hall. The figure of King Plutus might have been said to have changed his color. Everything now seemed to be the red of blood.

For a moment James paused as a welcome sound came to his ears. Fighting was going on in the grounds of the Temple. A few minutes later they obtained glimpses of Aurelius at the head of his troops, fighting his way down one of the corridors. Their war-cry came plainly to his ears, "For Prince James and the Revolution! Death to the Myrmidons!" Then, as they caught glimpses of James and his men fighting in the Hall of Plutus, the cry broke out, "To the Prince! To the Prince!" And with bloody charge repeated after bloody charge, they fought their way into the great Hall.

THERE could be no doubt now. The Myrmidons knew that the end was near. They were only a remnant of the millions that had fought from one side of the city to the other that day. But they were picked men. Lothaire had attacked the little band of revolutionists that had so mysteriously appeared in their midst, with his own body-guard. The others were survivors of the terrific fighting outside. Their officers were the greatest nobles in the Plutocracy. They fought with the courage of desperation and despair.

The great hall was full from side to side with a fighting, yelling, swaying, whooping, blood-thirsty mass. At one end of the hall, under the shadow of Plutus, the God of Riches, a noble in jewel-encrusted uniform, was being forced backward into the Fountain of Wealth, by a little group of revolutionists. Stepping backward to avoid a thrust, he lost his balance and fell into the basin of jewels. A dozen points were at his breast, when with cool courage he caught up a handful of the jewels, throwing them in the faces of his attackers, blinding them for a moment. Rubies, diamonds, sapphires, and opals fell unheeded on the bloody floor while the desperate fight went on. And presently, the noble's blood added to the color of the gorgeous gems.

Lothaire's usually expressionless face was now dark with anger and despair. His cause was lost. Now he could only hope for revenge before he died. He sought James in the bloody press of the fight, even as James was seeking him. The almost magical swordsmanship of the Superman cut his way from one end of the hall to the other with impunity to himself, but with death to his enemies.

At last James caught sight of him, and his mouth smiled while his blue eyes shone with a fighting gleam. Lothaire saw him and each turned toward the other. A moment later their blades crossed in a struggle that was to go down in the history of the country as one of the greatest duels that ever took place. Lothaire was

generally accounted the best swordsman in the country, and James had been accustomed to vanquish all foes almost without effort. Such was Lothaire's anger, that for the first time his coolness deserted him and he tried to rush his opponent. He might just as well have rushed the marble wall of the building. James touched him twice, drawing blood both times. The wounds were slight, but the pain served to clear Lothaire's brain. He began to fence with the caution and skill that had accounted for scores of his enemies in the past.

James saw before him the living embodiment of all that he hated in the coldly cruel and mercilessly efficient Plutocracy. He did not forget that it was Lothaire who was responsible for the death of his father, sister, and hundreds of his friends and comrades. His sword darted for Lothaire's breast like a striking snake or a burning flame. His men crowded around him to help finish the most hated general of the Plutocracy, but he waved them away.

"This is my fight!" he said.

"Then it will be your last," taunted Lothaire.

"Only because with you dies my last enemy," said James grimly.

Thrust followed thrust faster than the eye could see, and both combatants were forced to save their breath for fighting. Feeling that Lothaire's defense was growing a little weaker, James showered his blows like winter rain. Lothaire retreated a step, then rushed. The next moment he felt Lothaire's point scratch his chest and realized that the seeming weakening had been a ruse. Only his agility had saved him from being spitted on his opponent's sword. Lothaire followed up his advantage with every trick known to the fencing masters of the day. He tried the "Three Point Thrust," hurling himself forward under James' guard, with his sword arm straight in front, until his left hand touched the floor. In this position his body was pointed behind his weapon and only his head was exposed to attack. It failed, and he barely withdrew himself in time to escape the counter-blow that threatened to split his head from crown to neck.

James tried some of the tricks that he had learned in the fencing salons. He had been taught by the best masters in the world, both from abroad and at home, but there was no feint or thrust that he could use, that Lothaire did not know the parry to. So the struggle went, master-swordsmen against master-swordsmen, with the advantage to neither for the first few minutes of the fighting. Gradually the hall was becoming quiet as the few of the Myrmidons that were still alive and the ever increasing numbers of the revolutionists turned to watch the combat between their leaders.

Now it was a test of endurance. The terrific pace had brought the perspiration from James' every pore, and he could see that Lothaire was in no better case. Each could hear the other pant as steel struck sparks from steel. James thought he saw the dark blood of exhaustion in his opponent's face and pressed his attack with renewed vigor. Lightning-like thrust was followed by equally quick parry, and on the heels of the parries came the ripostes that carried the threat of death with each move. James began to have the better of it as Lothaire tired. Lothaire's face showed a surprised expression as he realized that he, a Superman, was proving inferior to an ordinary mortal. He gave back a step. James came on with his sword weaving a circle

of light before him and Lothaire retreated again. Wild cheering broke out from James' men. The Myrmidons ground their teeth.

Lothaire tried one last trick. As James' sword was near his chest, he brought his left hand from behind him and caught its point in a desperate grasp. At the same time he thrust with all his force at the unprotected body of his enemy. The trick was strictly a dishonorable one and James was caught unawares. He saved himself by leaping aside. With a savage wrench he freed his blade from Lothaire's hand, leaving a wound that all fighting men over the face of the world would count a dishonorable one, and returned to the attack. Unnerved by the failure of this last ruse, Lothaire loosened his grip on his weapon, and it was hurled from his hand by a powerful thrust.

"Surrender or die," thundered James. But Lothaire wanted to do neither. He turned on his heel, and evading a dozen clutching hands and thrusting points, ran for the stairs that led to the gallery around the room. Closely followed by James, he reached the stair and fled upward. Only two strides ahead, he gained the balcony, and running at top speed, circled it for one-half its distance. Barely ahead of James and his men, he reached a window that opened above the grounds outside. He

stood poised a moment there, and then dove head foremost toward the ground. James and his men lined the window a second later. Below was a small ornamental pond. It was surrounded by James' guards. Lothaire could not escape. Then his head showed above the water, swimming strongly. A volley of shots followed from the troops on the bank, and he sank for the last time.

James looked long before he returned to the blood-stained Hall of Plutus. He showed frank joy at Lothaire's death but his emotions were not entirely unmixed. Cruel rascal as he was, Lothaire had also been a mighty fighter and a brave man.

A swift cruiser landed in the grounds of the Temple. It came from the south. As James returned to the hall, he saw Avic entering to welcome him.

It was there, in the death-strewn Council Chamber of the Plutocracy, in the wonderfully beautiful Temple of Plutus, that James, with Avic standing proudly by his side, heard a terrific shout break from his victorious troops.

"Hail to the Emperor of America! No longer Prince James of the Kingdom of the South, but Emperor of America from the frozen Arctic to the blue Caribbean!" they shouted. "Long life to our Emperor and Empress."

THE END.



In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of five to cover time and postage is required.

THE SKYLARK STORIES AND EINSTEIN

Editor, AMAZING STORIES:

After reading Mr. Campbell's discussion of Dr. Smith's "Skylark" stories, I set out to juggle a few expressions of my own, in an attempt to find the energy required to give a body the velocity of light. Of course, the fact is not altered in the least that Dr. Smith plays havoc with the newer mathematical physics, but we cannot check him by experience, and we cannot understand the work of Einstein and the rest well enough, as yet, to intelligently combat him with fundamentals. All of which does not alter the fact that "Skylark Three" was at least as good, and possibly a bit better than "The Skylark of Space." There are no kinks coming from me on that score! However, I played a bit with equations and I obtained an interesting relation for my answer. My work may have a flaw in it, if so, I would like someone to point it out, for my own benefit, at least. The mathematical demonstration follows:

In order to give a body a certain velocity, its kinetic energy, or energy of motion, must be increased to a suitable value.

If we let E equal (kinetic) energy
 M equal mass of the body at
 any instant

V equal velocity of the body at that instant, then physics shows us that

$$E = \frac{1}{2} M V^2 \quad 1.$$

Differentiating

$$dE = M V dV \quad 2.$$

If the mass of the body remained constant, equation (1) would be strictly true over any range, using a constant value of M .

However, relativity has shown that the mass of a body is a function of the velocity in accordance with the Lorentz-Fitzgerald equation

$$M = m \cdot \frac{1}{\sqrt{1 - V^2/c^2}} = \frac{M_0}{\sqrt{1 - V^2/c^2}}$$

If we now substitute in equation (2), we find that

$$dE = \frac{M_0}{\sqrt{1 - V^2/c^2}} \cdot V dV$$

If we substitute in (2), we find

$$dE = \frac{M_0 V dV}{1 - V^2/c^2} \quad (4)$$

To find the total energy required to change the velocity of the body from zero to c (the velocity of light), we integrate between those limits,

$$= m c \sqrt{1 - V^2/c^2} = -m c^2$$

where the negative sign indicates that the energy must be absorbed or put into the body.

In other words, the energy required to raise the speed of any body from rest to the velocity of light is equal to its mass at rest multiplied by the square of the velocity of light!

As Mr. Campbell has also shown, this equation is none other than Einstein's equation for the energy equivalent to a given mass—the amount of energy to be derived from annihilation of matter—the energy that Jeans and Eddington think is the source of the eternal fires in the stars. Unless my equations are incorrect, or incorrectly based, it seems evident that for a body to be speeded up from rest, or near-rest, to the velocity of light, its own mass, or an equivalent mass, must be annihilated and used as energy. Interesting, to say the least!

All velocities that we can attain here on earth by known means are so insignificant compared to the velocity of light that they may be considered zero. Still, for any original velocity at all, the equation is

$$E = -m c \sqrt{1 - V^2/c^2}$$

and the energy can be tried for any initial velocity. Since it is derived from Einstein's equation, this breaks down for V greater than c . One example, the energy needed to speed up an electron to light speed. Here

$$\begin{aligned} m &= 8.994 \times 10^{-28} \text{ grams} \\ V &= 5.948 \times 10^{10} \text{ cm/sec.} \\ c &= 2.998 \times 10^{10} \text{ cm/sec.} \end{aligned}$$

and solving E equals 8.0835 $\times 10^{-7}$ ergs of energy, even at the high speed of the electron practically indistinguishable from the energy—equivalent of its mass—one unit in the fifth place of logarithms, or less. Of course, it is the small initial mass of the electron that makes the amount of energy so small. Properly, this energy should be less, for some of the mass of the electron is due to its high velocity. With more time, and better tables of logarithms, I could get closer to the real value if need be.

There isn't much space to say more. I welcome any and all attacks on this calculation. I agree with Mr. Tarkenton that Triton would probably have been crushed (the ray-projectors would certainly have been) but that doesn't spoil the story. If you revive the Annual for reprints, would it not be best to print some of the older stories that you have on your hands, rather than reprinting early stories from AMAZING STORIES? Those classics should be made available in some form. Try some of Verne's untranslated short-stories and possibly the "Moon Voyage"; maybe a little Wells, though what he has left probably wouldn't be popular; Serviss; Cummings; Hall and Flint; the earlier "Dr. Hackensack" stories, or, at least, the best of them; John Taine—all the old classics, including what is left of Merritt. It would be slow going, and an extra classic serial and a short story or so during the year, in the monthly, won't hurt. Or you might print them as a set of scientific classics—stiffer covers, better paper and artists, or no artists, perhaps, at 50 cents apiece. No matter how we get them, we want those classics, and with most of the bigger publishing companies issuing rural scientific magazines and stories, to say nothing of the smaller ones, you can't let a new and good author aside to revive an old one, in the regular course of events. A review-annual or a set of pamphlets will do the trick. I'll trust to your judgment and

(Continued on page 477)

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In the Realm of Books

The Next Two Thousand Million Years

"Last Men and First," by C. W. Olaf Stapledon. Published by Jonathan Cape and Harrison Smith, Inc., 139 East 46th Street, New York. 371 pages. \$2.50.

"LAST MEN AND FIRST" is a sociological fantasy—a grandiose history of mankind. Though Stapledon's book is an imaginative forecast of mankind's history for two thousand million years, delving deeply, yet always plausibly into social, political and biological possibilities, it actually reads as though it might have been written by a great historian like Ferrero. It is always dispassionate, merely purporting to record things as they have happened, which through his clever style and treatment, seem to become indisputable actualities.

The book starts with the present race, which becomes thoroughly Americanized for about 400 years. We read of cycles of wars—the European war—the Anglo-French war, the Russo-German war, the European-American war, and the Sino-American war. America reigned supreme until the exhaustion of the Antarctic coal resources destroyed its strangle-hold on the world. From then on history puts on seven-league boots. 100,000 years later the Patagonian civilization destroys itself and almost all humanity and the earth, by the careless release of atomic energy. A few hundred survivors start the second race, reaching their pinnacle of development in physically perfect human beings 10 million years later. Then came the invasions of the Martians, beings totally different in structure and absolutely alien in thought processes from the Terrestrials, which invasions almost wiped out the magnificent second race. From the survivors, the third race develops, small of body, but gifted with knowledge of arts and great biological experiments. They, in turn, created the fourth race—enormous Brains, housed in vast steel buildings living for ages and ages. These Brains reduced their creators to slaves and from these slaves the great Brains, designed, created and evolved the fifth race. This race forged ahead considerably. They developed interspace travel and foreseeing the time when the moon would fall upon the earth, started to make the planet Venus a fit habitat for humanity.

On Venus develops the sixth race, retrogressing in intelligence and size during two hundred million years and finally changing into small-winged men—the seventh race. The ones who could not fly and were otherwise crippled or considered unfit were segregated on the numerous islands for which the flying men had no use anyhow, but from the non-flyers developed the eighth race. This eighth race destroyed the flying race and became great engineers, rediscovering the secret of interplanetary travel. A dark star is discovered which threatens to destroy the inner planets. Migration is again necessary. Neptune is the only planet found suitable, but to overcome the terrible gravity of their prospective new home, a new race must be bred.

This is the ninth race, which, during 200,000,000 years on Neptune, degenerates thoroughly into sheep and bat-like creatures. Then, in rather short periods of about twenty-five million years, the tenth, eleventh, twelfth and thirteenth races are developed—races to which the term "human" could hardly be applied. The next is the fourteenth race, which again

shows an upward trend. It lasts for 300,000,000 years, evolving the fifteenth race, a truly great race.

Then appears the last race, the eighteenth, which has inherited an astonishingly marvelous body structure, and a stupendous longevity. But the final end of the last race, the end of all humanity draws near. Certain changes in the sun indicate his breaking up. His light changes to blue-white, then purple, showing internal disruption and disintegration. A cosmic tragedy is soon to occur. It is impossible to migrate again. But the wish to perpetuate the race is strong and the last men start to scatter into space an artificial human dust, bearing the potentialities of life and spiritual development, from suitable points, on the planet's orbit.

Eighteen distinct races are described minutely. Yet throughout the entire book, Mr. Stapledon sticks closely to what we know of science—physics, evolution, mutation of races, of species, biology and biochemistry. He even succeeds in imagining and in describing things which are utterly alien to us on Mars and Venus.

Reading this book is difficult at times, but it is worth careful study. It is a masterpiece in the realm of scientific fiction.—C. A. Brandt.

"The New World of Science Series"

"This Mechanical World" by Morton Mott-Smith. Published by D. Appleton & Company, New York, \$2.00.

THIS book is one of Appleton's "New World of Science Series" and we can express our opinion in a few words in saying that Dr. Davis, the Editor of the Series, made a wonderfully good selection when he chose this introduction to popular physics as a member of his series. The book is most interesting. Prof. Morton Mott-Smith, perhaps partly due to his experience as a lecturer and writer on scientific topics, has produced an intensely interesting book. We may take the expression that "it reads like a Novel" as giving an idea of its popular interest. The readers of AMAZING STORIES are assumed to be interested in natural science, and we know that the assumption in many cases is quite correct, but we doubt if any of them will fail to be interested in this little book. It is a combination of popular treatment with accurate statement. A very interesting feature is that constant reference to the old time scientists is made, for even Newton is now considered one of the old school. But it is quite delightful to see how he figures in this work as one of the preeminently great minds of the world. While the book is largely in the realm of classic physics, Einstein is not neglected and the reader will find an excellent treatment of many of the theories in his doctrine of relativity. An interesting point is brought out in reference to Comets, to the effect that their paths may all be ellipses, the old, long accepted idea of the parabolic and hyperbolic paths being open to doubt.—T. O. C. S.

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experience. **AMAZING STORIES** has acquired a certain "class" and caste—don't lose it now!

I won't review the present issue, as I have not read it all. It seems uniformly good, as usual. "Drums of Tapes" should run the Kline and Kline serial into a corner. R. F. Staral, John W. Campbell, Jr., and Stanton A. Coblentz are always good—it's a habit with them, now. "Discussions" is better than ever (I read it first, too) particularly Mr. Wertebaker's letter. Blessed be the author who can take his attitude and will—*as A. Merritt does—quality first, and then quantity.* And don't drop the book reviews—include some of the scientific works of interest as well as the new scientific novels. A majority of the readers should be able to tackle them with understanding. And always luck and more luck.

P. Schuyler Miller,
302 S. Ten Broeck St.,
Brooklyn, N. Y.

(Mr. Campbell, Jr., is one of our authors who ranks high in the reader's favor. His stories contain so much science that they are eliciting numerous letters from our readers, only some of which are giving in the Discussions Columns. The stories in their entirety are always great favorites with our readers, so we will allow him to take care of your calculations. We are receiving many suggestions about the publication of old, rare classics as reprints, and we are giving these suggestions our very serious consideration. Though we will probably not consider publishing reprints in the regular issues of the magazine because, as we have stated frequently, we have so many good original stories, but we may be able to derive some of your suggestions by these many requests by publishing occasional supplementary issues.—EDITORS.)

ROMANCE IN STORIES

Editor, **AMAZING STORIES**:

I have been reading your magazine, **AMAZING STORIES**, now for two years and I like it very much. It is hard to get here at times and I get a substitute, but it sure shows that it is a substitute.

I have read all the discussions for a long time and noticed a lot of kicks registered about romance in these stories. The long run, romance is necessary to any type of story or they would die out. I like the stories with romance in them and I think most of your readers do, too, for I notice most of the recent letters call for a return to "Siskyle" or "Siskyle Three." I rather think those stories are more romantic than anything else. Furthermore, why won't those kickers let people who do like these stories enjoy them? They surely get enough for their money if they only read one story in each magazine.

Please tell your authors that they are *JILL* excellent for me. Sometimes anyone makes a fiasco of the best start in the world. The same way some of the authors do. I think it very unjust to continue to knock some author just because he turned out one story not up to the readers' expectations. Please, for the sake of an old reader do not make *ANY* changes in this magazine, just because of two or three out of many thousands of readers who like this magazine just as it is.

I will say for your magazine: it contains many novel ideas that could be capitalized upon. It certainly changed my ideas on science in general. Hereafter I have words of praise as an author, but ready completed field of endeavor, but at the present, I can visualize much space in which to expand.

As I am very interested in science I would like to see some ideas having to do with present day theories, theoretically proving or disproving them. In the May 1931 issue, "A Voice from the Ether," was a story in proof of the atomic theory, and even went a little further, "Through the Dimensions" was near the type I mean, and if both these stories had a little romance interwoven in them, they would have been perfect.

Ned F. Waite,
1601 W. 14th St.,
Finsburg, Ark.

(We think that those of our friends, who have difficulty in buying **AMAZING STORIES** at the newsstands, would feel well to subscribe. As regards kickers, we feel that they are as much entitled to consideration as those who honor us by appreciating what we are doing. Our own opinion is that romance is an excellent element and that it plays a very fine part in many of our stories. We are endeavoring to avoid changes in **AMAZING STORIES** unless we feel that they are conservative in the best sense, and tend to improve the magazine. We are in accord with your views.—EDITORS.)

AN APPRECIATION FROM JAPAN

Editor, **AMAZING STORIES**:

I like to read your magazine but my English very poor and must use dictionary.

Why not make Japanese publication "A. S.?" I am sure it will be great success since young Japan fascinate science.

H. Hayashi,
Kanda-ku,
Tokyo

(This and the following letter are interesting as coming from Orientals and certainly it would be most interesting to know from actual experience how a Japanese issue of **AMAZING STORIES** would be received by the Nipponese readers. The Japanese have done wonderful work in science, perhaps we should almost fear them as critics.—EDITORS.)

A CHINESE READER'S CRITICISMS

Editor, **AMAZING STORIES**:

Your wonderful and amazing magazine has filled every dull moment for me a year and a half. It was first introduced to me by my pal.

I want to praise your artists on the fine drawings they have been doing. There is one thing I want to suggest and that is, why do your artists always draw Martians almost like human beings? They seem to always have two eyes, two arms, a body, and two legs like us earthlings. I would like to see drawings in the future with different looking Martians.

So far, nearly all of your stories have been very interesting to me. And on that, I have no criticisms to offer.

I am only a boy of thirteen and Chinese. I am most interested in your stories containing Chinese men as the villains. Please don't always pick on them, I am sure others would do.

According to my opinion, our magazine is the best of its kind on the market. I don't mean maybe!

Howard Lowe,
606 West 137th St.,
New York City

(The editors feel sometimes that they have to repress the desires of their artists who wish to introduce monstrosities in their illustrations of our stories. One of our friends, who is German, has written to many German villains in our stories and we do not feel that we have been doing your nation at all badly. Your letter is really remarkably well written and we want to compliment you for it and also thank you for the kind expressions you devote to our work.—EDITORS.)

A VERY SPIRITED LETTER ABOUT MR. CAMPBELL AND DR. SMITH

Editor, **AMAZING STORIES**:

I have been a constant reader of your monthly and quarterly since I got hold of the January, 1930, copy accidentally, and I count that a most fortunate accident. But I am not writing merely to praise, however well it is deserved, for I have a definite, perhaps even noble purpose in making my first attempt to break into the Discussions Columns.

Campbell and Smith have for some time been openly challenging the readers to find flaws in the science of their stories. So far, they have been able to get away with it, and except for fights in the family, if you know what I mean, there has been little action. In the May issue, however, Campbell answers some very mild objections, and then says something to the effect of "Set them up and push them over," meaning that the objections entered to date. This has so aroused my normally peaceful nature that I hereby declare war not only on Campbell, but along all fronts, and if the innocent suffer with the guilty, why, they have my sympathy.

The first offensive is, fittingly, against Campbell, in the "Solarite" salient. The objective is a most vital point, the method of propulsion of the space ship "Solarite," and its principal weapon. I shall prove that the operation of both of these, as described, violate a most fundamental law of mechanics.

This law states that the path of the center of gravity of a system of bodies cannot be altered by the forces developed within the system. To illustrate: If a bomb is thrown in space, follows a certain path, and then explodes, the position of the center of gravity of all the gases, pieces of metal, etc., coincides exactly with the position the center of gravity of the bomb would have occupied at the same instant, if unexploded. The same law applies, not only for explosion, but for any other conceivable forces, provided only that they are exerted from inside the system, or,

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A THEORY ABOUT THE UNIVERSE WE LIVE IN AND ABOUT THE NUMBER OF STARS

Editor, AMAZING STORIES:

I have been a reader of your magazine for quite a while and like it very much. But I must say that some of your stories are a bit tall. "The Skylark of Space" and "Skylark III," are the limit. Dr. Smith takes the limit for his imagination. His stories leave one gasping. I enjoyed them immensely, but to assume them remotely possible! Well, well. When he asks one to believe the possibility of traveling four times the speed of light? Why, this would mean that an illuminated object would travel faster than the light emanating from it and therefore, if traveling in a circle, would meet itself or its apparition coming back. A big fault of the "Skylark" stories was the making of the inhabitants of distant planets all assume human or near human form. Only like conditions can produce like results and we look in vain for duplication in the Universe. Not even two humans born under generally similar conditions are alike. I think the author of "A Baby on Neptune" got nearer the mark.

Again, why do all your writers make use of the idea of thought transference as solving the problem of intercommunication between peoples or creatures of entirely different worlds? This idea presupposes that such a thing as pure thought exists. I defy anyone to think in other terms than the language or languages he knows. A user of the English language cannot think, say of rock, without using the word "rock"; and if the user of another language succeeded in transferring his thoughts he would not succeed in making the English user understand what he meant, but would only succeed in transferring his word for rock, which would be unintelligible.

Again, is our universe as big as many scientists would have us believe? I boggle at accepting all the theories of millions and millions of men, some thousands of light years away. It is all pure conjecture. Einstein is nearer the truth. Space is limited and the universe may be a comparatively small affair. The only thing we know about the universe is that nothing is constant and that everything is in a state of flux. As the philosopher Hegel put it: "Nothing is, everything is becoming."

Now to conclude with a bombshell against orthodox theories. Space is not limitless. Euclid's straight line does not exist. Space is curved. So are all celestial bodies and the orbits they move in. Antennae as there could be no straight lines of suns and stars, some incalculable distances away. But how can that statement be proved? I look out at night at the numerous pinpoints of light above, but how can I say that I am looking at so and so many stars? The universe being limited, the few stars within it, and I believe they are only few, must have traversed the same circuit hundreds, aye thousands of times. I fix on a pinpoint of light, but that is not a star—merely the light coming from the spot it occupied so many light years ago. Therefore I am only gazing at the ghost or apparition of a star. That star makes a circuit of the universe, makes many circuits and its relative distance to us constantly varying—the pinpoints of light I see to be the rejected stars—may only be duplication of the one star.

Our Sun as a star would occupy, say a billion years ago, a position infinitely remote from the position it occupies today, therefore one of those far pinpoints of light may be light which originally emanated from our Sun long ago and which we are meeting again. In other words, the starry heavens are studded, not with millions and millions of suns, but with the many million duplications or reflections of the light of comparatively few stars.

I am afraid I have been longer than I intended, but wish you all success with your mag. It takes one out of the rut and makes one think. And in doing that you are doing real good.

32 Chestnut Avenue,
Hedding, Leeds, England.
(Letters from our English correspondents we always expect to be serious and well thought out, and yours is no exception. The size of the universe and the distribution of matter in it, while they have been very carefully studied by the brightest minds of the present day, are a profound mystery. Our modern scientists have waked up to the fact that this mystery really exists, and they have abandoned the aggravating mid-Victorian way of stating theories as positive facts. Do you know that an English-speaking person would think of a rock without formulating in his mind

the four letters which spell it? We certainly wish that we had more correspondents as interesting in their communications as you.—Editor.)

NO COURAGE IS NEEDED TO ENTER THE DISCUSSIONS COLUMNS

Editor, AMAZING STORIES:

Instead of starting one of the time tried program of this story E, that story G, I shall attempt to tell you what gave me the courage to write you.

When I received my May copy of A. S., I turned, as usual, to the Discussions. And there I found a gentleman from Australia slaying our well known Edmond Hamilton. Smith and Verill have their supporters by the dozens, so it is about time Mr. Hamilton found a defender. His indefensible something, which few stories possess, gives color, human interest, and a touch of reality to the story. It makes Hamilton's work a masterpiece.

I agree with Mr. Binder and Mr. Rodloff that last May's issue was an unusual number. The cover was especially fine.

There were three stories during 1930 which stand out in my mind. The "Universe Wreckers," for reasons mentioned above, "Skylark Three," for all around good construction, and "The Mar from the Moon," by Otis Adelbert Kline, for its extreme plausibility.

If one would glance through the pages of "The Universe Wreckers" again one would notice the immense number of opportunities for a good story. I have waited patiently and will continue to hope for it. What a tale that would be!

Robert Dryden,
1602 Grand Ave.,
Evanston, Ind.

(We are very glad that you enjoyed Mr. Hamilton's story. He is a distinguished writer, but has been somewhat criticized, largely on the basis that his stories vary in merit.—Editor.)

SCIENTIFIC FICTION FOR MOTION PICTURES

Editor, AMAZING STORIES:

I suppose I am not the only reader of scientific fiction who has often wondered why so few motion pictures have been based on this popular type of literature. While the films have gone on heavily for Western, love and crime stories, the science fiction field almost entirely the rich and fertile field of scientific fiction. Of course, there have been a few notable exceptions, such as "The Lost World," "Metropolis," and "How Rocket to the Moon." But these were white elephants hurried in the deluge of hokey from Hollywood.

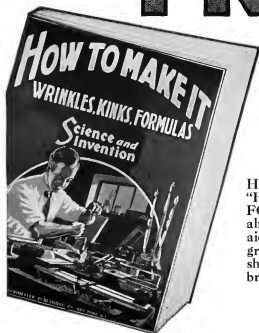
The indifference of movie producers to scientific fiction as screen material is probably due to a mistaken idea on their part that the public does not care for such pictures. The fact is that scientific fiction was never more popular than it is today. There are six or seven magazines that specialize in this field, and a half dozen others that use such stories quite frequently. The public is alert to scientific progress; the average man is more or less familiar with such topics as interplanetary travel, utilization of atomic energy, future of the race, and so forth. The discovery of Pluto last year and the recent visit of Professor Einstein to America have resulted in a new wave of "science-conscious" than ever. Motion pictures based on scientific themes would, I am sure, receive a hearty welcome from a public fed up with gangsters, sex and sentimentality on the screen.

Perhaps if a sufficient number of readers of AMAZING STORIES wrote to various film companies asking for more pictures with a scientific angle, their request would be heeded. Some time ago, I sent a letter along that line to Carl Laemmle, President of Universal Pictures, suggesting that a good tale might be made from Mrs. Shelley's "Frankenstein," a widely-known story of the scientific type. Now I understand that Universal will do "Frankenstein" in a few months. Here's hoping it will be followed by more of the same kind.

Alan Glasser,
1610 University Ave.,
New York, N. Y.

(Your letter is very interesting and some of our writers have indicated that they have some hopes in the direction of the movie story. Perhaps a good many AMAZING STORIES fans will take up your suggestion. We would be glad to help wherever possible. We can think of a number of our stories that might make excellent movies, in the new scientific equipment studios. Here's hoping that A. S. gets a chance on the screen.—Editor.)

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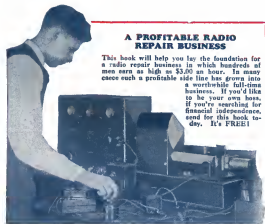
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